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THE MEASUREMENT OF THE CHARACTER AND ENVIRONMENTAL FACTORS INVOLVED IN SCHOLASTIC SUCCESS

by

FRANK K. SHUTTLEWORTH, Ph.D.

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BRIGHAM YOUNG UNIVERSITY LIBRARY PROVO, UTAH

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FOREWORD

The measurement of intelligence has already reached and passed its peak of profitable returns for education until new methods of analysis are devised or fresh situations arise. The low correlations between the intellectual abilities of students and their academic accomplishment has been a challenge to explore other than the cognition factors involved in a profitable college career. This second monograph from the Institute of Character Research presents the results of an excursus into the more subtle elements determining student success.

Dr. Shuttleworth's study is concerned with the perfecting of three kinds of technique for the teasing out and isolating of some of the elements of personality that are difficult to measure. The first of these is an "assayer" for determining the degree of the likes and dislikes of students for revealing words and phrases. For the reason that the attention of the observer is constantly directed in this test to an outer situation the device escapes many of the faults of introspection and furthermore yields quantitative data that can be treated statistically. The second technique he has employed is a point-scale self-rating device in the use of which the mind of the observer plays sharply between the two diametrically opposite extremes of a very specific trait. This also brings quantitative data that can be treated scientifically. The third test is a questionnaire for the measurement of environmental factors. In their final form as presented in this document these tests should prove of distinct service to the practical work of personnel departments in colleges and universities.

Dr. Shuttleworth has done more than master techniques. The research is fruitful in constructive results. It throws light on the character and environmental factors determining student success and failure and promises help to the interests of higher education.

Preliminary work looking towards this research was done during the academic years 1923-25. The results of that study were presented in partial fulfillment of the requirements for the degree Doctor of Philosophy in the Department of Philosophy at the University of Iowa. The present monograph very briefly summarizes that dissertation and two other studies and concentrates on a detailed presentation of similar work carried on during the year 1925-26.

ACKNOWLEDGMENTS

The author wishes to indicate his indebtedness to those who have materially aided in this research. To Professor Edwin D. Starbuck, who originally aroused his interest in character measurement, who directed the preliminary experimental work and whose never failing support and enthusiasm have done more than anything else to make this study possible. To Dean C. E. Seashore, whose pointed criticisms and suggestions have led to improvements in the testing method and whose interest in personnel problems continues to be a constant inspiration. To Professor Edward C. Mabie, head of the Department of Speech, and the instructors in that department, who have graciously and generously assisted in giving the tests.

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CHAPTER I

INTRODUCTION

The General Problem

There is perhaps no more crucial and complicated set of problems in higher education than the right adjustment of student, instruction, and administration to each other. Shall John Smith go from high school to college, to a trade school, or directly into the work of the world? If he goes to college, shall he take the Liberal Arts course, or enter a professional school? What shall be his major interest in his chosen college? Should his promise of outstanding, average, or mediocre success determine his admission to college? Should these different levels of ability condition the type of instruction to be adapted to him? What should be done if John Smith possesses only one degree of ability but gives returns as if he had four, and still fails? And what of the individual with ten degrees of ability who produces results from only six, and "gets by"?

Among these many problems, the major interests of administrators have centered rightly in the adjustment of students to their scholastic difficulties and opportunities. Of the thousand freshmen who annually enter the College of Liberal Arts at the State University of Iowa approximately 175 drop by the wayside the first semester. Many of these perhaps should never have entered college; yet a goodly number who leave school are of average and even superior ability. Among those who remain in college an additional number fall far short of achieving the success which their true capacities warrant.

Three Methods of Attack

There are three overlapping yet distinct points of view from which these maladjustments may be approached. The attack may be upon the educational procedure. Intensive studies have been made and more are needed in devising the best methods of instruction to be adapted to the average and less gifted student. The need is even greater for educational procedures which will call forth high endeavor and creative achievement from the superior student.

Too often the individual possessing high ability and doing average work is automatically labelled lazy or pleasure-bent when the real difficulty is that the educational machine, constructed for the mass, fails completely to minister to his needs.

A second point of attack is through the administration and personnel departments. It is sometimes suprising what a five-minute interview with a student will accomplish. More often it is provoking to find that the labors of months have apparently gone for nought. In an intensive study of seventy-six individuals with scholastic problems during the school year 1924-25, the author was able, he now feels, to correctly diagnose the difficulties of scarcely more than half. Of those correctly diagnosed the majority were already definitely labeled by mental and educational tests. About thirty cases remained unsolved problems. Although they obtained distinctly higher grades the semester following intensive personnel work this does not indicate that any large proportion of the explanations entertained for their difficulties was correct. The experience of the author is perhaps typical. A certain number of cases of scholastic difficulties automatically solve themselves, others present more or less obvious maladjustments which can be remedied, a larger proportion are traced by mental and educational tests to a lack of the necessary ability or training. Yet, depending on the optimism of the personnel worker, the individuals who continue to present problems still make up from one-fifth to one-half of the total number. With these cases the natural tendency is to search, haphazardly and usually in vain, the present and past environment, the habits of living and working, and the personality and character for "causes" of the maladjustment.

The third method of attack is by means of tests and measurements. Adequate measures of intelligence, of special aptitudes, of reading ability, and of educational training have proved exceedingly valuable in dealing with scholastic problems. The suspicion remains, however, that such tests do not measure everything,—that there are other factors of environmental background and of character and personality which need to be measured. If adequate measures of these factors were available, the personnel worker might proceed to attack the whole problem, and especially the more persistent and stubborn cases, with some hope of more definite success.

One of the concerns of the present monograph is the problem of

supplying improved tools for this third method of attack. Its center of interest is the measurement and analysis of the environmental and character factors involved in scholastic achievement.

The Need for Further Tests

Before defining more exactly the problem of this research it is important to study the present testing situation in order to determine its needs. With these needs in mind, it is then necessary to ask whether existing measures of intelligence, of special abilities, and of informations are adequate.

It is important in determining the needs of a testing program to keep in mind that it is not a significant approach in and of itself. The center and core of things is the educational process. Tests and measurements are significant only in so far as they minister to this larger program. Accordingly it is not the technical needs of reliability and validity that are here in question, but the larger requirements of the personnel department and administration which must deal with the student in relation to the life and purpose of higher education.

From this point of view, further advances in test construction should be in three directions. The first need is for measures of the subtle factors of environmental background and of personality and character traits. The personnel worker using exclusively the interview method of obtaining his data will fail as often as not to get at the significant facts of the case. The selected character of the individuals he ordinarily deals with and the impossibility of subjecting his guesses as to the causes of their difficulties to any objective test tend inevitably toward the building of sets of biases. It is worth pointing out that personnel workers have been inveterate builders of questionnaires which ask for supposedly significant facts concerning the environmental background, but the author has yet to see a single report of a systematic tabulation of the elements of such information blanks to determine whether the questions asked are really significant. From his own experience in tabulating one such questionnaire (see Chapter II) he ventures the guess that not more than 30 per cent of the elements in the general run of freshman questionnaires are really significant. In the field of personality and character the guesses of the personnel worker are apt to go even further astray.

In constructing more adequate tests the second need is for an-

alytical tools which will isolate and yield distinct scores for all the separate factors which may be involved. Mental and educational testing have recently made great progress in supplying this need. There now are available for purposes of predicting scholastic achievement not only tests of general intelligence and of general information, but also tests of special abilities and aptitudes and tests of information and training in particular subjects (see Stoddard 29). The analytical nature of the scores from such tests have proved exceedingly valuable. This type of analysis is greatly needed in the measurement of the non-intellectual factors.

The third need is for more exact prediction of failure or success. Early builders of intelligence tests, even those who obtained the most favorable correlations, were much discouraged over the results. The correlations between intelligence and academic achievement, centering around .40 and .50, were lower than they had been accustomed to consider significant. Even a correlation of .60 eliminates only 20 per cent of the errors involved in a pure guess. With such correlations it is very difficult to deal effectively with the individual. The personnel and administrative departments will succeed in adequately adjusting the individual only to the degree that they can know in advance what he will do under certain conditions.

This emphasis of the need of more exact prediction, however, is not a plea for mechanization. A fatally perfect prediction of success or failure might be a triumph of test construction, but it would certainly be a disgrace to any institution. Let it be the business of the test maker to increase the accuracy of his forecast of what will happen if the total situation is left to run its course unmolested. Let it be the business of the personnel and administrative departments, acting on this forecast, to make certain that the total situation is *not* left unmolested. The present need is for closer prediction. When better tests are constructed, they should start forces to work which in the end will destroy their own prediction.

Adequacy of Mental-Educational Tests

The growing success of mental-educational testing at the college level raises the important question whether such tests may not prove adequate to meet the three needs which have been outlined above.

At first thought it might seem that such tests could never measure factors of past environment and of character and personality. This is not entirely true. Stoddard (29) has pointed out that a four-

hour testing program, such as the entrance examinations at the University of Iowa, may be a very adequate measure of persistence. To whatever extent environmental factors and character traits contribute to the successful or unsuccessful acquisition of the skills measured by such tests, to that degree they measure these factors. But the degree to which this is true remains a matter of sheer conjecture. Until it is determined by experiment that tests of the environmental and character factors involved in college success yield scores correlating excessively high with mental-educational tests, the way lies open for attempts to measure these non-intellectual factors. Similarly, although available tests probably measure to some degree the non-intellectual factors, it remains impossible to determine what they are. Only their isolation and measurement by special tests will prove adequate.

The remaining question, whether tests of general intelligence, of special abilities, and of informations can alone provide the closest prediction of scholastic success, is much more difficult to answer. Constant improvement in such tests and the inaccuracy and unreliability of grade points as measures of scholastic achievement are two complicating factors which make a dogmatic answer impossible.

The briefest survey of the development of mental-testing at the college level shows how dangerous it is to forecast the limitations of these methods of testing. At the time of inception of this study it seemed clear that intelligence tests would not prove to be adequate measures of scholastic success. The impulse to do mental testing at the college level had come from the personnel work of the recent war. Naturally the tools which had proved useful in the army were the first to be tried in this new field. Army Alpha was given extensively to college students. But the results were disappointing. The correlations reported by various investigators between Army Alpha and college achievement ranged from .15 to .50. Such correlations, eliminating not more than 15 per cent of the errors involved in a pure guess, seemed to indicate that intelligence played but a small part in college success. (See Pintner 21 for a summary of the work up to 1923). This was the situation at the beginning of this study.

In the meantime the building of test batteries especially constructed for college students has led to considerable improvement. The Terman Group Test of Mental Ability, the Otis Group Intel-

ligence Scale, the Thurstone Psychological Examination, and the Thorndike Intelligence Test have given predictions ranging from .30 to .60 (Pintner 21, Hoke 5, MacPhail 14, Thorndike 32, Wood 41, Terman 31, Toops 34). At the University of Iowa the use of a reading comprehension test and an extensive examination over high school content in addition to tests of intelligence, has for five years given correlations with grades falling consistently between .45 and .65. Recently the construction of aptitude and training tests by Stoddard (29) has raised considerably the prediction of success in particular subjects and has distinctly raised the prediction of general scholastic success.

The second complicating factor, the unreliability of grade points, is amenable to more exact analysis. We know how closely available tests predict first semester grades. We should like to know how closely an entirely adequate battery of tests would predict first semester grades. The difference between the actual prediction and this estimated perfect prediction would yield a measure of the adequacy of present tests and of the proportion of factors as yet unmeasured.

The usual procedure for estimating the closeness of a perfect prediction has been to correlate first with second semester grades. If this correlation is, for example, .75 it is usually assumed that the prediction cannot be higher. Such a procedure overlooks two factors. It attempts to determine the errors involved in first semester grades by scores which are themselves fallible. And it fails to take account of the fact that, at the University of Iowa at least, approximately 15 per cent of the students who complete the first semester fail to complete the second. Since these students who drop out the second semester are very largely the poorer students, the obtained correlation of first with second semester grades is distinctly lower than if all students continued through the entire year.

A much better procedure would be to correlate first semester grades with a composite of all grades subsequently earned during the remaining three and a half years of college and then to correct this correlation for the restricted range of talent which is necessarily involved. The sheer labor of such an approach to the problem and the centering of the interest of this study on the class which entered in 1925 and whose college record is not yet complete has necessitated the abandonment of this procedure. Instead the less adequate method has been used. For the sake of definiteness the con-

clusions from the data are stated as if the perfect prediction of first semester grades would coincide with the correlation between first and second semester grades.

At the inception of this study a careful analysis was made for the year 1923-24. At that time the problem was limited to men and only men were considered. The correlation of the entrance examination percentiles* with the first semester grade points was .54, P.E. .02, the population being 596. First semester grade points correlated with second semester grade points .72, P.E. .01, the population being 513. The second correlation involved eighty-three fewer cases, many of them being students who dropped out of school the second semester because of failing work during the first semester. Examination of the standard deviations indicates that if these eighty-three students had remained in school the correlations of first semester grades with those of the second semester would have been over .75. A correlation of .54 eliminates 16 per cent of the errors of pure guessing; a correlation of .75 eliminates 36 per cent. If elimination of 36 per cent of the errors of pure guessing is used as the standard of approximately perfect prediction, then the obtained prediction of .54 is measuring about one half of the measurable factors. For this year, accordingly, the available tests were clearly inadequate to yield the maximum prediction.

A more detailed analysis of the situation for the year 1925-26 reveals a considerable improvement in the predictive power of mental-educational examinations. The problem had shifted to the measurement of factors involved in the scholastic success of men and women, and the analysis of the data was accordingly made for both sexes.

Complete data (composite entrance examination percentiles,† first semester grades, and second semester grades) were available for 516 men and 301 women. Incomplete data (composite percentiles and first semester grades, but lacking second semester grades) were available for 602 men and 340 women. Table 1 presents the obtained

* These percentiles were derived from three tests properly weighted to predict scholastic success. The tests were Thorndike Intelligence (40 minutes testing time) Iowa High School Content Examination (80 minutes testing time) and Iowa Comprehension (36 minutes testing time).

† For the year 1925-26 these percentiles were derived from four tests properly weighted to predict scholastic success. The tests were: Iowa High School Content Examination IA (60 minutes testing time), Iowa Comprehension DI (36 minutes), English Aptitude EAI Revised A (40 minutes) and English Training ETI, Revised A (40 minutes). The last two were taken from the revised Iowa Placement Examination series, see Stoddard (29).

data. The correlations of first semester with second semester grades for men are .681, for women .704, and for men and women .697. For the same cases the correlations of composite entrance examination percentiles with first semester grades are .568, .604, and .588. If the correlations of first with second semester grades are considered as the standard, these data indicate that the mental-educational tests are measuring about two-thirds of the measurable factors. Accordingly, even assuming this low standard for perfect prediction, there is still room for improvement.

The Special Problem

The immediate needs, therefore, which this research attempts to meet concern the matter of supplying additional, specialized, and effective tools which will aid the personnel department and the administration in more adequately adjusting students to the processes of higher education. And this at once focuses attention on the problem of the building and testing of these tools. Or more exactly, the special problem is the construction and validation of tests of those character and personality traits and of those environmental factors which are involved in scholastic achievement.

It is easy enough to devise possible tests. The difficult problem is that of validation, to determine whether the tests really measure

Table 1

Correlations, means, and standard deviations for men, for women, and for men and women for the indicated variables at the State University of Iowa, 1925-26.

Variables

1. Composite percentiles, cases with complete data
2. Composite percentiles, cases with complete data plus those with incomplete data
3. First semester grade points, cases with complete data
4. First semester grade points, cases with complete data plus those with incomplete data
5. Second semester grade points, cases with complete data

Populations, Means, and Standard Deviations

Variables	Men			Women			Men and Women		
	N.	M.	S.D.	N.	M.	S.D.	N.	M.	S.D.
1.	516	50.80	28.89	301	58.47	26.72	817	53.63	28.35
2.	602	49.07	29.61	340	54.54	27.26	942	50.10	28.98
3.	516	1.64	1.02	301	2.04	.84	817	1.89	.98
4.	602	1.45	1.20	340	1.93	.93	942	1.62	1.13
5.	516	1.73	.98	301	2.04	.81	817	1.83	.93

Correlations	Men	Women	Men and Women
r_{13}	.568 ± .02	.604 ± .03	.588 ± .02
r_{35}	.681 ± .02	.704 ± .03	.697 ± .02
r_{24}	.584 ± .02	.676 ± .03	.635 ± .02

what they purport to measure. The literature on methods of measuring character has very recently become extensive. Without attempting an adequate survey of this field,* it may be said that two procedures have been used to determine validity. In the first, the attempt is made to build test elements which are valid on the face of them. For instance, Voelker (35) sends a boy scout to the grocer to buy supplies. The grocer is instructed to over-change him. Will the scout call attention to the error? Or Slaght (27) counts the pieces of candy in a box which he places before a child with instructions that they should not be eaten until permission is given. He leaves the room and on returning asks if any candy has been eaten. Will the child tell the truth? One hundred such test items adequately sampling situations involving honesty would yield a valid measure. So far experimenters have found it exceedingly difficult, if not impossible, to construct such tests for any character traits save those of honesty and cheating.

In the second type of procedure the attempt is made to build test elements which are symptomatic of character traits and then to determine the correspondence between reactions to such elements and some outside objective criterion. Thus if one desires to measure the character trait of sociability, test elements may be devised and given to sociable and non-sociable individuals to determine if the tests actually differentiate them. Or, if the attempt is being made to measure delinquency traits, supposedly diagnostic tests may be given to delinquent and normal children. The tests or test elements which show differences between these groups thereby become validated tests of delinquency. The difficulty with this procedure is to discover outside objective criteria for the traits to be measured.

The present study employs the second or indirect method of validation. The procedure is, first, to devise tests the elements of which are supposedly diagnostic or symptomatic of traits thought to be associated with scholastic success. When these tests have been given to large numbers of students, the second step is to determine the test elements yielding responses which actually differentiate between successful and unsuccessful students. The first and second

* The following references include the more important surveys and bibliographies available: Bingham and Freyd (1), Cady (2), Cleeton (3), Furfey (4), Hollingworth, A. L. (6), Hollingworth, Letta (7), Jung (9), Khos (11), Kornhauser (12), Kornhauser and Kingbury (13), Manson (15, 16), May (17, 18, 19), Starbuck (28), Symonds (30), Watson (36, 37, 38), Wells (39), and Whaley (40).

steps are then repeated alternately until a reasonable degree of validity is established.

The special problem of this research is admirably adapted to a thoroughly sound approach to the measurement of character by the second method. The advantageous features from a technical and scientific point of view are worthy of some special mention. The objectivity, validity, and high reliability of university grades solves at once, for the purpose of this research, the whole perplexing question of a suitable criterion. The availability of large numbers of cases in a study which is naturally statistical is very important. The fact that these cases form a rather homogeneous group, with scholastic abilities falling into a normal distribution, makes possible the use of correlation methods. The opportunity for repeating the test from year to year is another earmark of a sound approach because it makes possible the gradual accumulation and verification of significant facts. A final advantage is that the problem by its very nature requires that a prediction of success or failure be made in advance of the actual performance of students. Verification and prediction are acid tests which as yet have been rarely applied to measures of character.

While the problem has its advantages, it also has its challenging difficulties, difficulties which are common to all attempts to measure character by the second or indirect method. The major portion of the present study describes techniques for the solution of these difficulties. From another point of view, therefore, the special problem concerns the technology and methodology of measuring character.

We turn now to the details of the construction and validation of the three tests developed in this study: the Assayer, the Self-rating Device, and the Questionnaire. Chapter II presents the preliminary work and describes each of these tests. They were given to the members of the freshman class in January of 1926. Chapters III, IV, and V are concerned with a detailed analysis of the data obtained from that testing. In each of these chapters the reader who is not interested primarily in the techniques may turn directly to the last section interpreting the data in terms of the factors associated with scholastic failure and success.

CHAPTER II

PRELIMINARY EXPERIMENTAL WORK—DESCRIPTION OF TESTS

Introduction

The body of this study (Chapters III, IV, and V) is concerned with a detailed analysis of data obtained in January of 1926 from the members of the freshman class at the State University of Iowa. The test battery given at that time consisted of three distinct parts: an assayer, a self-rating device, and a questionnaire. This chapter describes these tests and surveys briefly the preliminary experimental work on each.

The Assayer: Hypotheses

The assayer (see Appendix I) is a test of likes and dislikes or of attitudes and interests. Its fundamental hypothesis is that these are symptomatic of character traits. Presumably those who succeed scholastically have different likes and dislikes and different interests from those who fail. If these differences can be determined, the information can be used in predicting achievement.

The successful application of this hypothesis involves four specific problems: (1) the construction of a suitable test form which will enable the subject to record rapidly and accurately his likes and dislikes, (2) the selection and discovery of suitable stimuli toward which the subject is to indicate his attitudes, (3) the devising of methods for item-by-item validation and for determination of differences between the interests of those who succeed and those who fail, and (4) the testing of these differences by using them to predict scholastic success. The preliminary work on each of these aspects of the problem can best be presented by an account of the development of the present form of the assayer.

The Assayer: First Experimental Work

Considerable experimental work was undertaken from 1923 to 1925 on each of these four steps. Like many researches, the early efforts were far beside the mark and accordingly may be summarized most briefly. The first experimental work was determined by the

results of a study of other-ratings in a fraternity group and by an opportunity created by Dr. Hornell N. Hart and Elmer Olander (20). The ratings had shown that energy-laziness was closely related to college achievement. Hart and Olander had submitted a form of the assayer to 600 high school students and had obtained teachers' ratings on various character traits. Among the traits rated was energy-laziness. This body of data seemed to offer an excellent opportunity for a preliminary trial of the assayer principle.

The form of the test used in this and two later investigations was as follows. Stimulus words and phrases such as "religion" and "hear music" were arranged in lists of fifteen. A plus and a minus sign were placed after each stimulus. The subjects were instructed to draw a circle around the plus sign after the things they liked, a circle around the minus sign after those they disliked, to skip the items to which they were indifferent, to underline five in each list about which they felt strongly, and to double underline the one about which they felt most strongly. These instructions yielded seven possible reactions: double-underlined negative, single-underlined negative, negative, indifferent, positive, single-underlined positive, and double-underlined positive.

The method of analysis consisted in comparing the responses of pupils rated "energetic" with those rated "lazy." About forty of the test stimuli showed significant differences in the likes and dislikes of these two groups. A scoring method was devised for these forty items and applied to a sample of seventy-five cases. The resulting scores correlated .63 with teachers' ratings of energy-laziness.

The assayer was then revised to consist of these forty items and an additional 185 new items. The revised test was given to 237 University of Iowa freshmen in the spring of 1924. The scoring method for energy-laziness was applied to these cases and the resulting scores correlated with university grade points. The correlation proved to be .09.

The Assayer: Experimental Work of 1924-25

The complete failure of the attempt to measure factors of energy-laziness at the college level led to a radical change in method of approach. The energy-laziness attack had been made on the supposition that one trait at a time should be measured. The availability of 237 cases suggested that a blind trial and error attack might better serve

as the starting point. The 237 cases were accordingly analyzed by tabulating the responses of forty freshmen who had received high grades and comparing them with the responses of an opposed group of forty freshmen who had received low grades. About forty items showed what appeared to be significant differences by this method of analysis and seemed to warrant further trial of the test.

The assayer was again revised. A time limit and necessity of preserving the lists of fifteen stimuli intact made its impossible to experiment with new items. Accordingly, seven lists, totaling 105 items, were selected from the preceding test. This assayer was given to all freshmen entering the University of Iowa in the fall of 1924. Their responses were transferred to punch cards for classification on the Hollerith machine. The easy tabulation of data by this method made possible a very complete analysis (see Shuttleworth 25). The attack was centered on the last three of the specific problems referred to at the beginning of this chapter: discovery of differential stimuli, devising of methods for item-by-item validation, and testing of supposedly diagnostic items by correlation methods. Since the detailed analysis of the data of the subsequent year presented in Chapter III is similar, the results from the 1924 data also may be summarized briefly. Twenty-two clearly significant and an additional eight possibly significant items were discovered. Four methods of item-by-item validation were tried. Scoring methods were devised and applied to various groups of students. The resulting scores when compared with grade points gave correlations ranging from .25 to .49. Considering the small number of diagnostic items, equivalent to a five-minute test, these correlations were promising.

The Assayer: Form of the Test

Certain inadequacies in the form of the Assayer let to an attempt at improvement. The test as just described leaves the indifferent reaction uncontrolled. The reaction to each stimulus is also determined in part by the other items in the list in which it stands. This latter point is very important since a rearrangement of the items into different lists might entirely alter the distribution of the reactions. In the spring of 1925 the old form of the test and two new ones were given to sixty freshmen. Twenty-nine of these had received high grades the first semester and thirty-one had received low grades. The sixty freshmen were divided into three groups, taking the several forms of the test in different orders. Fifty-four stimuli

were common to the three forms of the test. Analysis of the data by comparing the reactions of the men who had received high grades with the reactions of those receiving low grades made it possible to determine which form yielded the most diagnostic results.

The form which gave the most significant differences for the two opposed groups was one in which the items were judged singly and severally instead of in groups. The stimuli were not placed in lists but each was allowed to stand by itself. The subjects were instructed to indicate their feeling toward each stimulus by placing a cross (x) opposite each item and under the following headings: "dislike very much", "dislike strongly", "dislike", "indifferent", "like", "like strongly", and "like very much". Not only did this method give the more significant differences but certain other advantages appeared. The subjects were asked which form was the easiest to respond to and 73 per cent favored this form. A careful check was kept on the time factor and it was found that 30 per cent more items could be responded to per unit of time under this form than under the old. These advantages, in addition to the freeing of the responses to each stimulus from the disturbing influence of other stimuli, made it clearly superior. The degree of likes and dislikes was then reduced to a five-point instead of a seven-point scale, for examination of the distribution of the reactions to this form showed that the "dislike strongly" and "like strongly" responses had been used only occasionally. Consequently, in the revision of the test given to freshmen entering in the fall of 1925 these responses were omitted.

In connection with this experiment the diagnostic value of 125 new stimuli was determined. About twenty were probably significant. These in addition to the thirty already available made possible the first adequate hypotheses concerning what traits were involved. The final revision of the assayer was made to include 200 new items intended to test these hypotheses (See Appendix I).

The Assayer: Summary of Preliminary Experiments

The perliminary experimental work made progress on each of the four specific problems. The old test form and two new forms were subjected to experiment. One of the new forms proved much superior to the old. Considerable progress was made in the selection and discovery of test elements toward which the subjects were to indicate their attitude. This progress is evidenced by the fact that upon analysis of the final revised test (see Chapter III) 156 items showed

significant differential reactions. Although none of the methods of item-by-item validation which had been devised were used with the new data, they directly laid the foundation for a rapid and effective procedure. The correlations and reliabilities obtained were for the most part low, but every indication pointed toward a higher reliability and closer prediction. Chapter III presents in detail the analysis of the new assayer. The results more than justify the laborious preliminary work.

A Self-Rating Device

During the preliminary experimental work with the assayer, a trial and error attack had proved so successful as a starting point that it seemed wise to continue this approach with other tests. A survey of available tests which had been given to a large number of students revealed two especially promising for this study.

One of these tests was a point scale self-rating device which had been prepared by Professor Edwin D. Starbuck. This test was in the following form.

Very dark hair . . . . : . . . . Very light hair
Dark complexion . . . . : . . . . Very light complexion

Subjects were instructed to rate themselves by checking on the dotted line between each pair of contrasted traits or qualities. A test of this type consisting of 175 items had been given to 550 sophomore men and women in the spring of 1925.

The ready availability of these data offered an opportunity for trying a new type of test and for discovering additional types of diagnostic items. The data were analyzed by comparing the responses of forty men who had received high grades with an opposed group of forty who had received low grades. Twenty possibly significant items appeared. An additional fifty-five items were constructed and combined with the twenty to make the self-rating device (see Appendix II). Chapter IV presents the results of analyzing this test.

A Questionnaire

The second available test was a questionnaire devised by Lonzo Jones (8) and given to all freshmen in the fall of 1923. Since this questionnaire had been specially constructed to measure the environmental factors involved in scholastic success, it seemed very promising. The information supplied by fifty men who had received high

grades was tabulated for all the items of the questionnaire and compared with the information supplied by an opposed group who had received low grades. Out of eighty comparisons only thirteen proved to be possibly significant. These items were combined with an additional thirteen to make the final questionnaire (see Appendix III). Chapter V presents the results of analyzing this test.

CHAPTER III

ANALYSIS AND RESULTS OF THE ASSAYER

Introduction

The battery of three tests desecribed in the preceding chapter (see Appendixes* I, II and III) was given in January of 1926 to all freshmen. When the first semester grades were recorded this testing yielded 494 cases of men and 269 cases of women for whom complete data were available. The present Chapter and Chapters IV and V present the detailed results from an analysis of that data. The major questions at issue in each of these chapters and for each test are the following: How steady and consistent are the responses to the individual test items? What is the reliability of each test? What is its predictive power for scholastic achievement? Does this prediction correlate sufficiently low with intelligence so that it can be said that other than intellectual factors have been measured? What does item-by-item tabulation reveal concerning the validity of single test elements? What light does this analysis throw on the factors conditioning scholastic success and failure?

Steadiness of Reactions

The assayer, it will be remembered, consists of 245 test elements, words or phrases, to which the subjects are to react by indicating the degree of their liking or disliking. Thus they are given such stimuli as "be absent-minded", "have a big allowance", "a few close friends", etc. They are to indicate their feeling about these things, i.e., whether "dislike very much", "dislike", feel "indifferent", "like", or "like very much". (See Appendix I).

The steadiness of the reactions to such stimuli was investigated by repeating the test after a five weeks interval with a group of thirty-eight students. Table two presents as an illustration the correspondence between the first and second reactions to the first two stimuli in the assayer. The table reads that the first time five students gave the strong negative reaction to the stimulus "be absent-minded", twenty-four reacted negatively, and nine reacted indifferently. Reacting to the same stimulus five weeks later, twen-

* The final revision of these three tests is presented in Appendix IV.

ty-six gave the same reaction as the first time and twelve changed their reaction by one degree of disliking. This indicates a fair degree of steadiness. To state this consistency accurately in numerical terms is difficult because the nature of the data does not conform

Table 2.

Correspondence between first and second reactions of thirty-eight students to the first two stimuli in Part I..

	First Reaction	Second Reaction D	d	?	1	L	Totals
"be absent minded"	L	0	0	0	0	0	0
	1	0	0	0	0	0	0
	?	0	5	4	0	0	9
	d	3	21	0	0	0	24
	D	1	4	0	0	0	5
	Totals	4	30	4	0	0	38

	First Reaction	Second Reaction D	d	?	1	L	Totals
"have a big allowance"	L	0	0	0	3	4	7
	1	0	2	0	15	3	20
	?	0	1	2	2	0	5
	d	0	2	0	4	0	6
	D	0	0	0	0	0	0
	Totals	0	5	2	24	7	38

to the assumptions underlying any of the usual methods of measuring relationship. However, two methods for measuring this steadiness were used. The first consisted of determining the percentage of identical responses. This gave values ranging from 44 per cent to 79 per cent for the first two lists of items in the test. The average of identical responses was 62.4 per cent; the average displaced one degree was 32.6 per cent; the average displaced two or more steps was 5.0 per cent. The second procedure consisted in the use of a Pearson coefficient of correlation. While such a procedure involves serious errors because of the nature of the data, they result in under-stating rather than over-stating the steadiness of the reactions. For the first two lists of stimuli in the test these correlations range from .05 to .81, the median correlation being .46. These data insure that the reactions are made with some care and remain fairly steady.

The Problem of Item-by-Item Validation

The alteration of the form of the test necessitated by the experiments in the spring of 1925 made it problematical how the various

test items would perform. Accordingly no prediction of scholastic success was undertaken. The first step, therefore, in the analysis of the new body of data was an item-by-item validation.

The simplest method of testing the validity of each individual item would be to tabulate the responses of a group of students who received high grades and to compare these with a similar tabulation of the responses of an opposed group of students who received low grades. Simple comparison of the extreme cases according to scholastic achievement would yield the items diagnostic of this factor. The aim of the test, however, was to measure the residual factors of character and personality not measured by the available mental-educational examinations. Experience with the assayer had demonstrated that it was exceedingly sensitive to the influence of intelligence. Many of its items might easily be far more diagnostic of this factor than of any other. It was imperative, therefore, that item-by-item analysis do more than merely select the test elements correlating with academic success. It must also separate from among these the items primarily diagnostic of the non-intellectual factors.

Considerable experimental work was undertaken during 1924-25 in an effort to devise the least laborious and most efficient method for accomplishing this separation. It will be recalled from Chapter II that the data of 1924-25 were transferred to punch cards preparatory to classification on the Hollerith sorting machine. The easy tabulation of data in this form made it possible to experiment with four different methods of analysis. Since the problem of discovering the test elements measuring residual factors will become more and more crucial as refinements in testing procedure continue, these four methods are worthy of brief notice.

The first of these methods compared the reactions of 100 men who had received high grades with an opposed group of 100 who had received low grades. This, supplemented by a similar comparison as to intelligence, made it possible to determine roughly which items correlated most highly with grades and which most highly with intelligence. The difficulty with this method is that forty or fifty cases are common to the two comparisons. In the second method, comparisons of extreme cases as to scholarship were made separately for different ranges of intelligence. Thus from among the cases showing mental-educational examination percentiles between sixty and ninety-nine, the extreme twenty-five cases according to grades

were compared. This was repeated for groups having intelligence percentiles between one and forty and between twenty-five and seventy-five. The difficulty with this procedure is that, when the different ranges of intelligence are considered separately, the number of cases involved becomes too small for reliable statistical results. In the third method, the correlation (Bi-serial r after imposing a dichotomy) of each test item with grade points and mental-educational percentiles was determined. With these data it was possible by means of partial correlations to determine the correlation of each test item with grades independent of intelligence. The use of this method presupposes the use of the Hollerith machine else the labor involved becomes excessive. The fourth method was as follows. Forty cases receiving the highest grades and intelligence percentiles were compared with forty cases receiving the lowest grades and intelligence percentiles. From among the remaining cases similar comparisons were made for the forty cases with next highest and next lowest grades and for the forty cases with next highest and next lowest intelligence. By placing these three comparisons side by side for each test element it was possible to determine which comparison gave the most significant differences.

The Method of Item-by-Item Analysis

The method of analyzing the data from the testing of January 1926 was a modification of the fourth procedure just described. External circumstances* led to the choice of the most rapid procedure. Four hundred ninety-four cases of men and 269 cases of women were available. From the men, a random sample of 120 cases were selected and laid aside, and the item-by-item analysis made of the remaining 374 cases. The number of women was too small to permit the laying aside of such a sample. The problem was to analyze with a minimum of labor these 643 cases in such a way as to determine the test items diagnostic primarily of scholastic achievement. This was done by analyzing 292 cases at the extremes of the distributions of grades and intelligence.

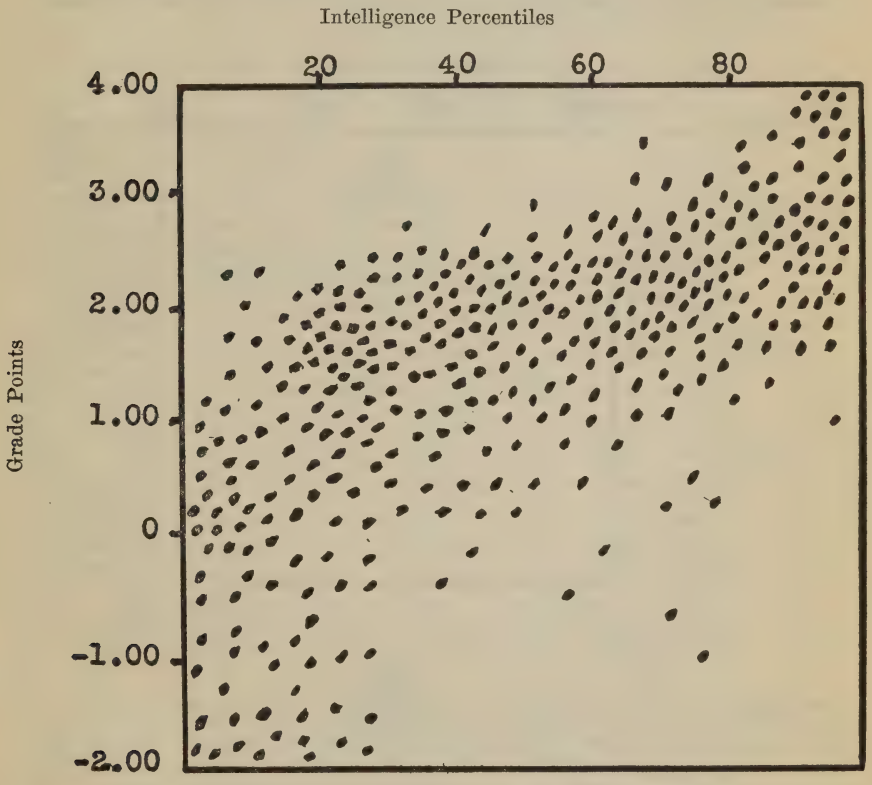
Reference to Charts I and II will make clear how the extreme cases of the men were selected. Chart I is the scatter-diagram for

* To avoid confusion later, it may be explained that analysis of the questionnaire was undertaken first by the Hollerith machine method. The data for men from the self-rating device was in process of analysis by the same method when an unexpected opportunity arose of repeating the test in the fall of 1926. It was necessary to use a more rapid and less exact method of analysis with the assayer than had originally been planned.

men of the correlation of grades with intelligence. From this scatter-diagram the cases of men falling into areas A, B, C, and D of Chart II were selected. The procedure used was to select alternate-

Chart I

Scatter-diagram of the correlation of grade points with intelligence percentiles; 374 cases of men.

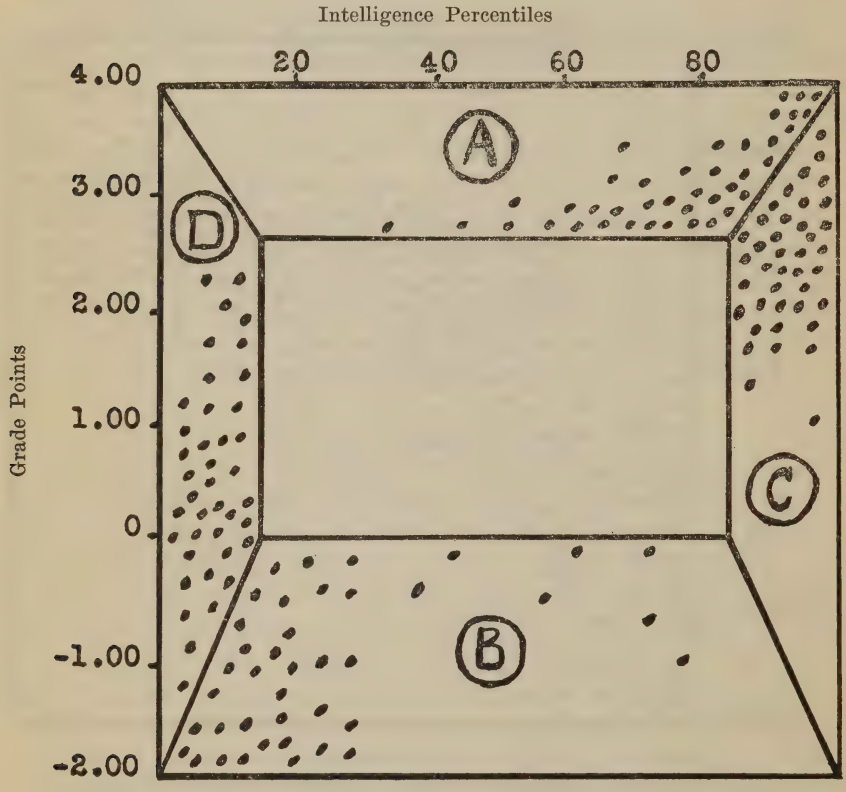


ly the case having highest grades and highest entrance examination (intelligence) percentiles. The procedure was continued until forty cases falling in areas A and C were obtained. The cases in areas B and D were similarly selected. This procedure is, of course, arbitrary and was chosen, as just indicated, because of the pressure of external circumstances requiring a rapid method of analysis. The principle involved is the control of factors determining achievement partially isolated from the influence of the factors determining the entrance examination percentiles. Thus if the cases in areas A and

B show large differences in their responses to a number of items in the assayer and if small differences to the same items are obtained from comparing areas C and D, then such items should yield a rela-

Chart II

Showing areas of the scatter-diagram given in Chart I from which men receiving relatively high grades (area A), relatively low grades (area B), relatively high intelligence percentiles (area C), and relatively low intelligence percentiles (area D) were selected.



tively high correlation with grades and a relatively low correlation with intelligence.

Groups of women were selected in the same manner save that, with the smaller number of total cases, fewer test blanks were selected from each area. Thirty-three cases were selected from areas A, B, C, and D.

The reactions to each of the 245 test items of each of these groups

were tabulated. The A and B groups (relatively high and low grades), and the C and D groups (relatively high and low intelligence), for men and women were compared.

Correlations

What is the validity of the method of analysis which has been described above? The assumption is that items showing larger differences on the A against B comparison than on the C against D comparison are more diagnostic of scholastic success than of intelligence. We may test this assumption by scoring a group of such items and correlating the resulting scores with grade points and with intelligence percentiles.

Inspection of the detail of the reactions shows in general a tendency for the difference in the responses of the A as opposed to the B group to parallel the difference of the C as opposed to the D group. That is, items diagnostic of scholastic success also tend to be diagnostic of intelligence, and vice versa. In nearly all cases, however, it is possible to say from the data that a certain item is slightly more diagnostic or less diagnostic for scholastic success than for intelligence. In a good many instances the test elements are definitely of one type or the other. Table three presents, as a sample, the reactions of men to the two stimuli "limit free speech" and "church". Twenty-two or 55 per cent of the men in the A group react somewhat negatively (d, dislike) to "limit free speech" while only five or 12.5 per cent of the B group give this reaction. The observed difference of 42.5 per cent is very significant. No such difference appears when the C and D groups are compared. The

Table 3

Distribution of the reactions of various groups of men to the stimuli "limit free speech" and "church", illustrating the effectiveness of the method of analysis in separating items primarily diagnostic of scholastic success from items primarily diagnostic of intelligence.

	Limit free speech						Church					
Group	D	d	?	1	L	O.D. / P.E.	D	d	?	1	L	O.D. / P.E.
A	6	22	10	2	0	6.0	1	1	8	17	13	2.4
B	5	5	22	5	3		0	0	6	24	10	
C	7	16	15	1	1	2.4	2	4	13	20	1	6.4
D	5	11	15	8	1		0	0	2	26	12	

stimulus "church" reveals the opposite tendency. No significant difference appears from the reactions of the A and B groups, while for the C and D groups the difference is large.

The contrast between the two stimuli is even clearer when stated in terms of the elimination of chance factors. Table three presents the ratio of the observed difference to the probable error of the difference (O.D./P.E.). The probable error of the percentage difference was calculated from Yule's formula (42).

$$\text{P.E. percentage difference} = .6745\sqrt{pq}\sqrt{\frac{1}{n_1}+\frac{1}{n_2}}$$

where p is the proportion of a certain type of reaction, q equals 1-p, n_1 is the number of cases in one distribution, and n_2 the number in the other. Where the observed difference is six times as large as the probable error of the difference the likelihood is that with repeated trials under the same conditions such an observed difference would tend to occur or be exceeded by chance only once in 19,000 times. This indicates the significance of the item "limit free speech" for scholastic success. Its significance for intelligence is indicated by the ratio of 2.4. Here the likelihood that the observed difference is due to chance is one in nineteen.

The method of the probable error of the difference of two means was also used and gave similar results. The chief advantage of Yule's formula is that with constant populations tables can be prepared from which the significance of items can be read directly. In the present case, involving several comparisons on each of 245 items, this is an important factor.

It is clear from the analysis of the illustrative data given in Table three that the method of analysis, in particular instances at least, definitely indicates that some items are more highly diagnostic of factors associated with success than of factors associated with intelligence. Accordingly, a group of items similar to "limit free speech" should yield a relatively high correlation with grades and a relatively low correlation with intelligence.

For the purpose of testing the above analysis in terms of correlations the ninety-four test elements showing the largest differences on the two comparisons for men were selected. The one hundred twenty cases which had been chosen at random and laid aside prior to the analysis were scored on these ninety-four items. The scoring system was based on the analysis of the 374 cases and consisted of assigning plus one values to those reactions characteristic of scholastic success or intelligence. Thus the two items of Table three were assigned values as follows:

	D	d	?	l	L
limit free speech	0	1	0	0	0
church	1	1	1	0	0

This is admittedly a rough scoring method but experience with an attempt at a more exact weighting of such items had shown it to be unprofitable.

Calculating first the correlation of the 94 items with grades gave .422 ± .051, and with intelligence .541 ± .044. For these 120 cases the correlation of intelligence with grades is .636 ± .037. To determine whether the analysis had separated the items primarily diagnostic of scholastic success from those primarily diagnostic of intelligence the ninety-four test items were divided into two groups. One group consisted of thirty-four items primarily diagnostic of intelligence. These correlated .180 ± .060 with grades and .404 ± .052 with intelligence. The second group consisted of the remaining sixty items. These correlated .497 ± .048 with grades and .493 ± .048 with intelligence. These data amply justify the attempt to separate out the items diagnostic primarily of the non-intellectual factors involved in scholastic success. The partial correlation of these items with grades when intelligence is held constant is .294.

The significance of the correlation of these 60 items with grades is more clearly apparent when their reliability is determined. One half of these sixty items correlated with the other half gave .648 ± .036. By Brown's formula the reliability of the whole sixty items is .76. Considering this low reliability, the correlation of .497 with grades is promising.

Interpretations of Types of Response

The data presented under the heading of correlations, while testing statistically the power of this portion of the test to measure the factors involved, is not very illuminating of the nature of these factors. Here an effort will be made to classify the types of differential reactions which appeared in order to gain some insight into why certain students fail and others succeed.

To distinguish between items primarily diagnostic of grades as opposed to those primarily diagnostic of intelligence will not be profitable. Nor will any attempt be made to distinguish between the tendencies of men and women. In only three cases did the tendencies of men and women oppose each other.

In order to illustrate the types of differential reactions which were obtained, Table four presents summary data of the responses of men and women to the fifty most significant items.* In this case the table presents the responses of the sixty men who received highest grades (H-G) contrasted with the responses of the sixty men who received lowest grades (L-G). Similarly the fifty women who received highest grades are compared with the fifty women who received lowest grades.

It is to be noted that the comparison of H-G with L-G groups presented in Table four is not the same as the comparison of A with B groups (see Chart III page 30) presented in Table three. The A against B comparison controls the factor of intelligence. The H-G versus L-G comparison leaves the factor of intelligence uncontrolled. The H-G and L-G comparison, however, has the advantage of a larger number of cases at the extremes. It, accordingly, yields a more convincing picture of the radical differences in the likes and dislikes of the successful and failing student.

Table 4

Distribution of the reactions of groups receiving high grades as compared with groups receiving low grades to the fifty most significant items in Part I.

	Men						Women					
Group	D	d	?	1	L	O.D. / P.E.	D	d	?	1	L	O.D. / P.E.
						Be absent-minded, No. 1						
H-G	13	37	9	1	0	6.0	5	33	11	1	0	4.6
L-G	34	21	4	1	0		18	29	3	0	0	
						Have creative ideas, No. 11						
H-G	0	2	3	35	20	5.1	0	2	10	29	9	
L-G	0	1	18	35	6		1	2	8	31	8	
						Have to be frugal, No. 23						
H-G	5	34	15	6	0	7.4	12	28	10	0	0	6.9
L-G	2	14	42	2	0		4	13	28	3	2	
						Limit free speech, No. 30						
H-G	9	30	18	3	0	6.1	5	28	12	5	0	4.8
L-G	5	12	32	8	3		8	12	23	6	1	
						Repression of free speech, No. 34						
H-G	15	30	12	3	0	6.7	9	26	10	4	1	5.9
L-G	6	15	31	7	1		6	9	22	11	2	
						Save every penny, No. 36						
H-G	6	31	17	4	2	4.2	10	27	6	7	0	3.9
L-G	5	24	13	13	5		3	21	12	8	6	
						Anguish, No. 51						
H-G	17	31	8	4	0	6.4	14	28	4	3	1	4.8
L-G	6	20	31	3	0		7	21	18	3	1	

* A total of 156 items gave differences on one or more of the comparisons of 4 P.Es. or better.

Table 4 (Continued)

Group	Men D	d	?	1	L	O.D. / P.E.	Women D	d	?	1	L	O.D. / P.E.
						Ardent, No. 53						
H-G	0	1	15	38	6	6.9	0	1	8	37	4	4.2
L-G	0	3	38	17	2		1	1	20	24	4	
						Ankle, No. 52						
H-G	1	4	43	10	2	6.5	0	8	36	6	0	2.7
L-G	1	3	21	25	10		3	5	29	12	1	
						Aspire, No. 54						
H-G	0	0	8	38	14	3.1	0	0	4	35	11	6.2
L-G	0	3	14	35	8		1	4	17	25	3	
						Avarice, No. 55						
H-G	9	27	22	2	0	7.4	13	26	8	3	0	8.8
L-G	5	5	45	5	0		2	7	37	4	0	
						Blaspheme, No. 59						
H-G	26	25	8	1	0	5.7	18	24	6	2	0	3.6
L-G	11	21	27	1	0		10	21	15	4	0	
						Cards, No. 60						
H-G	0	5	28	27	0	5.4	1	9	20	19	1	3.9
L-G	4	12	10	31	3		4	7	6	31	2	
						Egotism, No. 67						
H-G	21	23	14	2	0	6.0	19	25	5	1	0	6.6
L-G	6	19	35	0	0		12	11	22	5	0	
						Free love, No. 72						
H-G	10	12	21	14	3	6.6	12	13	21	4	0	6.3
L-G	3	6	10	23	18		6	5	16	18	5	
						Hired man, No. 74						
H-G	2	13	42	3	0	6.5	1	9	39	1	0	
L-G	2	9	27	20	2		6	7	33	2	2	
						Obedience, No. 87						
H-G	2	3	14	34	7	4.0	0	7	14	28	1	4.6
L-G	0	2	7	32	19		0	1	6	32	11	
						Sermon, No. 89						
H-G	4	9	19	26	2	5.1	0	13	21	15	1	6.2
L-G	0	3	11	38	8		1	1	11	31	6	
						Smoke, No. 93						
H-G	9	18	18	15	0	4.8	4	21	21	4	0	4.7
L-G	8	11	9	29	3		17	17	14	1	1	
						Squalor, No. 96						
H-G	19	27	14	0	0	5.7	18	20	10	2	0	5.5
L-G	4	22	34	0	0		9	13	28	0	0	
						Wireless, No. 98						
H-G	0	4	30	21	5	6.6	0	3	28	17	2	2.7
L-G	0	1	10	29	20		0	3	19	22	6	
						Beethoven, No. 101						
H-G	0	1	25	23	11	5.1	0	1	3	30	16	4.1
L-G	0	4	40	10	6		0	2	13	17	18	

Table 4 (Continued)

Group	Men D	d	?	1	L	O.D. / P.E.	Women D	d	?	1	L	O.D. / P.E.
Cigarette, No. 107												
H-G	8	16	19	16	1	4.8	5	16	26	3	0	4.2
L-G	6	13	7	28	6		18	17	11	2	2	
Detail Work, No. 111												
H-G	3	20	26	10	1	5.1	2	13	27	8	0	2.8
L-G	0	11	21	24	4		3	9	22	14	2	
Drive a Car, No. 112												
H-G	0	3	4	37	16	4.0	0	1	8	31	10	4.1
L-G	0	1	2	27	30		0	0	4	23	23	
Electricity, No. 115												
H-G	1	2	29	24	4	4.2	0	2	26	19	3	4.6
L-G	1	4	12	32	11		2	3	11	29	5	
Immortality, No. 119												
H-G	4	9	26	15	6	5.2	6	3	18	16	7	5.9
L-G	16	15	25	3	1		15	13	16	4	2	
Irreverent, No. 120												
H-G	11	29	17	3	0	4.0	15	28	4	2	1	6.8
L-G	12	15	28	5	0		10	11	21	8	0	
Oppression, No. 129												
H-G	14	38	6	2	0	7.1	10	32	6	2	0	5.1
L-G	9	19	24	7	1		5	21	21	2	1	
Puritanical, No. 135												
H-G	5	30	20	5	0	7.7	3	26	15	6	0	6.4
L-G	2	8	41	7	2		0	8	27	14	1	
Rembrandt, No. 137												
H-G	0	3	28	23	6	3.7	0	0	22	25	3	6.1
L-G	1	5	38	12	4		1	2	36	6	5	
Sacrilegious, No. 138												
H-G	13	29	16	2	0	8.1	5	37	7	1	0	5.5
L-G	6	7	41	5	1		7	17	20	6	0	
Steady pay, No. 144												
H-G	0	1	6	38	15		0	2	10	36	2	5.4
L-G	0	3	2	35	20		0	3	3	28	16	
Swearing, No. 146												
H-G	9	28	21	2	0	4.4	14	29	6	1	0	4.5
L-G	23	28	5	4	0		29	20	1	0	0	
Abject poverty, No. 148												
H-G	28	25	7	0	0	5.6	25	15	9	1	0	
L-G	11	24	19	3	3		20	17	12	1	0	
Double standard, No. 162												
H-G	4	15	32	9	0	4.1	7	20	16	7	0	5.2
L-G	3	12	23	19	3		2	8	28	10	2	
Be inferior, No. 171												
H-G	21	34	3	2	0	5.9	12	38	0	0	0	10.0
L-G	18	19	13	8	2		8	21	11	8	2	

Table 4 (Continued)

Group	Men D	d	?	1	L	O.D. / P.E.	Women D	d	?	1	L	O.D. / P.E.
						Mental anguish, No. 178						
H-G	18	35	6	0	1	5.2	14	29	3	3	1	3.3
L-G	6	27	21	5	1		7	28	12	3	0	
						Slow but sure, No. 189						
H-G	2	15	21	16	6	5.8	2	13	12	20	3	4.0
L-G	1	4	10	35	10		3	5	7	28	7	
						Ask yourself if life is worth living, No. 197						
H-G	2	13	18	17	10	5.1	1	19	8	18	4	4.0
L-G	1	6	8	28	17		2	7	8	23	10	
						The fathers of the Constitution, No. 211						
H-G	1	4	12	29	14	3.5	1	0	14	31	4	5.0
L-G	1	1	11	21	26		1	1	6	24	18	
						Have to toe the mark in your classes, No. 217						
H-G	2	18	17	22	1	4.9	4	22	8	13	3	4.5
L-G	2	13	15	17	13		5	8	8	25	4	
						Inspect an automobile plant No. 220						
H-G	0	5	19	24	2	5.3	2	5	34	8	1	4.4
L-G	0	4	17	24	15		2	5	20	19	4	
						Work with machinery, No. 222						
H-G	5	9	23	23	0	6.5	2	15	29	3	1	3.0
L-G	0	7	7	34	12		7	17	19	5	2	
						Missionary work in the foreign field, No. 224						
H-G	2	16	31	10	1	3.9	3	11	24	10	2	4.0
L-G	1	11	24	19	5		1	8	16	20	5	
						Religious toleration, No. 232						
H-G	0	2	11	35	12	8.1	0	3	7	32	8	7.2
L-G	2	5	35	14	4		2	6	26	14	2	
						Repair an automobile, No. 233						
H-G	1	20	21	18	0	5.9	3	23	20	4	0	
L-G	1	13	7	32	7		4	20	22	4	0	
						Spiritual immortality, No. 238						
H-G	3	6	28	16	7	4.4	1	4	15	24	6	6.7
L-G	1	12	38	6	3		3	12	27	5	3	
						Start from bottom, No. 239						
H-G	1	10	26	20	3	6.7	0	13	11	25	1	3.7
L-G	0	4	9	34	13		3	6	6	30	5	
						The Star Spangled Banner, No. 240						
H-G	1	1	4	35	19	5.5	0	2	3	32	13	2.5
L-G	0	2	1	18	39		1	1	1	26	21	

Turning to Table four it will be seen that thirteen or 21.7 per cent of the sixty men in the high grade (H-G) group reacted strongly negative (D, dislike very much) to the item "be absent minded". To the same stimulus thirty-four or 56.5 per cent of the sixty men receiving lowest grades gave this reaction. The observed difference is 34.9 per cent which is six times as large a difference as would probably occur by chance. The differential reactions of the women are similar: five of the H-G group as contrasted with eighteen of the L-G group give strongly negative reactions. Both men and women failure groups show an excessive dislike for the stimulus "be absent minded" while the successful groups evidence only a moderate dislike.

The significance of such differences for an understanding of the problem of scholastic maladjustments is a crucial question. Are the reactions true indications of the real interests of the groups? Are the responses sincere or intentionally deceptive?* Is one group or both unconsciously assuming a false pose for the benefit of the test maker? In the case of the item "be absent minded" it is difficult to do more than treat the responses as bits of behavior which distinguish the two groups but which contribute little insight. For the most part, however, the items suggest rather obvious interpretations. The internal consistency of the data creates a presumption that the responses should be taken at their face value.

There are six fairly consistent tendencies. The failure groups evidence a markedly stronger liking for test items suggestive of mechanical interest. They react positively or strongly positively while success groups react indifferently or negatively to: "wireless", "build a radio", "repair an automobile", "be interested in mechanical things", "work with machinery", "invent something", "electricity", "work with delicate things", "inspect an automobile plant", and "Popular Science Magazine". The reactions of the women parallel those of the men very closely. Not only is the tendency very consistent and without exception but these are all the mechanical interest items in the test and all yielded significant differences. When the test was constructed actual data were available on only two of these items. The failure group are mechanically

* As the study goes to press the author has completed the analysis of a group of "sincere" and "deceptive" responses given under supposedly anonymous conditions. The original signed test blanks conform more closely to the "sincere" than to the "deceptive" responses.

minded. They have yet to experience rebirth from a life in terms of things to a life in terms of ideas.

A second and even more illuminating tendency reveals a decided lack of imagination, a thoroughly conventional, primitive, lock-step, and limited view of their place in the world on the part of the failure groups. Both men and women react more positively than the success groups to: "obedience", "do as you are told", "have to toe the mark in your classes", "obey the rules even when they are irksome", "slow but sure", "start from the bottom", "hired man", "detail work", "clerical work", "have a salary", "steady pay", "save every penny", "early to bed", "have to be frugal", and "be a follower". Consistent with this tendency, they strongly dislike "sleep late", "late hours", and "be free from rigid rules".

The next two tendencies are closely akin to each other and to the conventional reactions just presented. In the fields of religious and political interest the failure groups are conventionalists, fundamentalists, standpatters, and are intolerant of the opinions of others. The failure groups react more positively than the success groups to "be religious", "church", "sermon", "do religious work", "more use of prayer", "Christianize the world", "missionary work in the foreign field", "the old fashioned religion", and "sing 'Onward Christian Soldiers' ". That these are hard-shelled fundamentalistic reactions is shown by the fact that the failure groups react negatively or indifferently, while the success groups react positively to "immortality", "spiritual immortality", "spiritual", "aspire", "the world needs a new idealism", and "religious toleration". The last item is the most statistically significant of the group.

Paralleling this tendency in the field of political interests the failure groups react more positively to "patriotism", "The Star Spangled Banner", "America first", "the fathers of the Constitution", and "our country right or wrong". Their reaction to "unpatriotic attitude", and "enemies of the government" is strongly negative. The character of this tendency is clearly defined by their indifferent and negative reactions to "fair play for the slacker", and "humanity is above any nation"; to both of these stimuli the success groups react positively.

The failure groups are indifferent to test items suggestive of intellectual and cultural interests while the success groups react positively. The failure groups give a larger proportion of indifferent reactions to "creative", "leisure", "freer discussion", "have cre-

ative ideas", "to be open minded", "Beethoven" and "Rembrandt". They react indifferently while the success groups react negatively to "classic music is a fad", "limit free speech", "repression of free speech", and "slap stick comedy".

A final consistent tendency is revealed by the more positive attitudes of the failure groups to stimuli suggestive of pleasure-seeking interest. They show more positive interest than the success group toward "have a big allowance", "easy going life", "be lucky", "dancing", "ankle", "Pierce Arrow", "cards", "poker", "smoke", "cigarette", "swearing", and "canoeing".

CHAPTER IV

ANALYSIS AND RESULTS OF THE SELF-RATING DEVICE

Steadiness and Reactions

The self-rating device consisted of a series of self-rating items in the following form:

Very dark hair . . . . : . . . . Very light hair
Dark complexion . . . . : . . . . Very light complexion

The subjects were asked to rate themselves on these items by checking the colon if the contrasting traits seemed equally balanced, or by checking as far to the right or left as best represented their case.

The steadiness of the reactions was determined from the same thirty-eight cases studied in connection with the assayer. Since the scores were spread over a nine-point scale, a correlation is the best method of estimating the correspondence between the first and second reactions. For a sample of twenty test items the correlations ranged from .41 to .91, the median correlation being .64. These coefficients, considerably higher than for the assayer, indicate a satisfactory steadiness in the reactions.

Prediction

The original form of the self-rating device as constructed by Dr. Starbuck had been somewhat altered by changing the number of points on the scale from eleven to nine. This alteration, however, was not radical enough to forbid an attempt at prediction.

Actual data were available on the probable performance of only twenty test items. Hypotheses, however, were formed as to the performance of all but six items, and all excepting these were scored by assigning values of one to each reaction which was thought to be associated with scholastic success. A random sample of 225 cases of men was scored. Dividing the items into chance halves gave a reliability of .319, P.E. .038. By Brown's formula the reliability of the whole is .484. These scores correlated .369, P.E. .036 with grades and .309, P.E. .038 with intelligence. For these cases intelligence correlated .631, P.E. .026 with grades. Considering the low reliability the predictive power of this part of the battery is very high.

Item-by-Item Analysis

The analysis of the self-rating device was much less exact than for the assayer, due to the pressure of accidental and external considerations. The data for men had been transferred to the Hollerith cards. One hundred twenty cases were selected at random for verification of the scoring method. It was planned to calculate the correlation of each item with grades and, whenever these were significant, to calculate the correlation with intelligence.

The scatter-diagrams of each item against grades had been partly completed by plotting the extreme cases, when the opportunity arose for repeating the test in the fall of 1926. A time limit of twenty-five minutes on the revised test and the possibility of throwing the more significant self-rating items into the form of the questionnaire led to its abandonment in the revised test. The analysis is accordingly fragmentary and only men have been considered.

For purposes of easy handling the nine reactions were grouped into five. The data were then transferred to the Hollerith cards. The four reactions to the right of the colon were grouped to two reactions, the colon was kept separate, and the four reactions to the left of the colon were also grouped to two reactions. In starting to plot the correlation of each item against grades the students receiving highest and lowest grades were plotted first, the plan being to plot all the cases only in the case of items for which the extremes promised that the item would be significant. The thirty-six men receiving highest grades and fifty-seven receiving lowest grades had been tabulated when exact analysis was abandoned. Instead, the reactions of these high-grade and low-grade groups were compared and the significance of the differences in their reactions calculated by Yule's formula (see page 32). Twenty-six items showed differences exceeding the probable error of the difference by 3.5 times or more.

Eight items showing the most significant differences, 5.5 P.E. or more, were scored on a plus one, zero, and minus one basis. This scoring system was applied to the random sample of one hundred twenty cases. These scores correlated .381 P.E. .052 with grades and .305, P.E. .056 with intelligence. The correlation of intelligence with grades for these cases is .646, P.E. .037. Rough item-by-item analysis did not greatly improve the original prediction. The partial correlation of grades with scores on these eight items, intelligence held constant, is .254.

Interpretation of the Reactions

Four fairly consistent tendencies appearing in the reactions shed further light on the make-up of the student who fails and of the student who succeeds scholastically. Two of these tendencies confirm the findings from the assayer.

The test of likes and dislikes showed the inclination of the failing student towards fundamentalism in religion. The self-rating device contained four items concerning religious training in the home. All show a definite tendency for the failing students to report more strict religious home training although only two of the items are statistically significant.* Seven items inquiring about present religious attitudes, beliefs, and practices represented the failure group as likely to report themselves more religious, but only one item was significant.

According to the assayer, the successful student was more interested in intellectual and cultural things. Four items in the self-rating test attempted to get at the same factor. All proved statistically significant, three of them giving differences 5.5 times the probable error. The success group react to the left of the dotted line while the failure group tend to react to the right on the following items:

Intellectual	. . . . :	Practical
Like mental work	. . . . :	Do not enjoy mental work
Do not enjoy physical work	. . . . :	Like physical work
Much interested in art, drama, literature, etc.	. . . . :	Not interested

The third factor diagnosed by this test is discovered in the uniform tendency of the failure group to report "poor memory", "often forget important things", "worry over exams", "think slowly and deliberately", "difficulty in concentrating", "attention shifts", and "get confused and distracted during examinations". This tendency is not surprising, but the fact that it can be brought to light by this form of a test is significant evidence of the validity of such an approach.

The fourth consistent tendency is more illuminating. The failure group is apparently more dependent on social relations and less sufficient unto itself than the success group. As striking as the general trait is the diversity of items which reveal it. The success

* For confirmation of this tendency, see Shuttleworth (26).

group reacts to the left while the failure group tends to react to the right on the following items:

Dislike to work with people	Like to work with people
Stubborn and obstinate	Too easily persuaded
Often talk to yourself	Never aware of talking to yourself
Unconcerned about fashion and appearance	Attentive to dress and personal appearance
Perfect ease in staying in a room with the door closed	Cannot bear it
Content to be by yourself	Must have companionship

The items about religious training suggest the home as a significant factor in college achievement. In the next chapter, data will be presented showing the importance of other home conditions, such as the presence of magazines, newspapers, and musical instruments in the home, and the bearing of the education of parents upon a career. That the home is a factor is supported by two items representing still other aspects of its influence. The success group reports "Parents very strict in early home training", while the failure group tends to report "Parents permitted you to do as you pleased." Again the success group reports "Parents much interested in your school work", while the failure group tends to report "Parents rarely interested."

CHAPTER V

ANALYSIS AND RESULTS OF THE QUESTIONNAIRE

Steadiness of Reactions

The questionnaire part of the test battery consisted of a series of twenty-six informational questions about high school standing, home influences, etc. (See Appendix III).

The steadiness of the reactions to these questions was determined for the thirty-eight cases already used in determining the reliability of the other parts of the battery. Only the first sixteen questions were considered. The lowest reliability was obtained from question number fourteen concerning the amount of money spent the first semester. For this item the correlations between first and second responses was .56. For questions numbers one, two, three, thirteen, fifteen, and sixteen, the correlations were all over .90. The correlation for item twelve was .78. For items four to eleven the average correlation was .72. These data show a very high degree of steadiness.

Predictive Power of Part III: Scoring Method

A prediction of scholastic success was made from the questionnaire for 673 cases of men and women. Since this prediction corresponded rather closely with grade points but diverged considerably from the rankings of the mental-educational tests, a precise statement of the scoring method is in order. Exactly the same method was applied to both men and women and no adjustments of the resulting scores were made. The scoring system follows. The numbers given after each answer indicate the values which were assigned to each item of information.

1. *What part of your life have you lived on a farm?* Not at all: +1; 1 to 4 years: 0; 5 to 8 years: 0; 9 to 12 years: –1; over 12 years: –1.

2. *How large a town have you lived in for the greater part of your life?* Under 500: –1; 500-1500: –1; 1500-4000: 0; 4000-6000: +1; over 6000: +1.

3. *How many were in your graduating class?* 1-10: –1; 11-20: –1; 21-40: 0; 41-75: 0; 75-125: +1; over 125: +1.

4. *Where did you rank in your graduating class?* Top: +2; Upper 10 percent: +1; Above Middle: 0; Middle: –1; Below Middle: –2; Lower 10 per cent: –2; Bottom: –2.

Items numbers 5 to 11 were similarly scored.

12. *While in high school, how active were you in debate, oratory, dramatics, music, etc.?* One of the most active: +1; Among 10 per cent most active: +1; Above middle: 0; Middle: –1; Below Middle: –1; Among 10 per cent least active: –1; Took no part whatever: –1.

13. *During how many of your summer vacations since you began high school have you had a steady job?* None: +1; One: +1; Two: 0; Three: 0; Four: –1; Five: –1.

14. *How much do you estimate that your first semester here will cost you (include tuition and cost of clothing)?* $50-150: –1; $150-250: –1; $250-350: 0; $350-450: 0; $450-550: +1; Over $550: +1.

15. *How much schooling did your father have?* Less than 4 years: –1; 5-8 years: –1; Part of high school: 0; High school graduate: 0; Some college: +1; Received college degree: +1.

16. *How much schooling did your mother have?* Less than 4 years: –1; 5-8 years: –1; Part of high school: 0; High School graduate: 0; Some college: +1; Received college degree: +1.

17. *Whether or not you belong to a fraternity or sorority, do you think membership in one increases one's scholastic standing?* No: +1; Undecided: 0; Yes: –1.

18. *If you do not belong to a fraternity or sorority would you join if asked by a good organization?* No: +1; Undecided: 0; Yes: –1.

19. *Which of the following courses did you take in high school?* Latin, French, German, and Chemistry were given +1 values, all others –1 values.

20. *Name the sports in which you played on your high school team either as regular or as substitute.* None named: +1; One: –1; Two or three: 0; four or more: –1.

21 and 22 were not scored.

23. *Name the musical instruments you have in your home*: None named: –1; one named: –1; two or three named: +1; Four or more: –1.

24. *Name the reproductions of well known works of art and the paintings of good artists in your home*: None named: –1; One named: 0; Two or more named: +1.

25. *Name the newspapers*: None or one named: –1; Two or three named: 0; Four or more named: +1.

26. *Name the magazines or periodicals*: None or one named: –1; two or three named: 0; Four or five named: +1.

Reliability

The reliability of the resulting scores was tested by dividing this part into two hypothetical forms, one consisting of the odd numbered items and the other of the even numbered items. For 536 cases of men originally available the r obtained was .631. By Brown's formula the reliability of the whole part is .774.

Correlations

Table five presents the inter-correlation of this portion of the test for men, for women, and for men and women with first semester grade points and with the four tests making up the entrance examinations. It should be noted from the table that the zero order correlations with grades for men and women are fairly close together, ranging from .515 to .567. The inter-correlations of the four entrance examinations and the questionnaire vary considerably, ranging from .351 to .746. This results in some interesting data when the fourth order partial correlations are calculated. These are presented in Table six. The Reading Comprehension and Eng-

Table 5

Inter-correlations of questionnaire, first semester grade points, and the four entrance examinations for men (M), for women (F), and for men and women (MF). Number of men 494; number of women 269.

Variables	Sex	1	2	3	4	5	6
1. Grades	M		.563	.538	.586	.559	.557
	F		.484	.522	.419	.557	.536
	MF		.515	.522	.551	.540	.567
2. Reading Comprehension	M	.563		.746	.677	.746	.502
	F	.484		.656	.566	.669	.447
	MF	.515		.660	.590	.718	.427
3. English Aptitude	M	.538	.746		.667	.681	.536
	F	.522	.656		.600	.546	.417
	MF	.522	.660		.633	.592	.503
4. English Training	M	.586	.677	.667		.643	.479
	F	.419	.566	.600		.615	.351
	MF	.551	.590	.633		.536	.518
5. High School Content Examination	M	.559	.746	.681	.643		.563
	F	.557	.669	.546	.615		.561
	MF	.540	.718	.592	.536		.469
6. Questionnaire	M	.557	.502	.536	.479	.563	
	F	.536	.447	.417	.351	.561	
	MF	.567	.427	.503	.518	.469	

lish Aptitude do not measure independent factors. The Multiple correlations ($R_{1.23456}$) are for men .684, for women .657, and for men and women .682.

Since the information blank scores measure very largely high school standing it is important to note the correlation of these scores with the Iowa High School Content Examination, an objective examination over high school materials. These correlations are .563, .561, and .469. Since the Iowa High School Content Examination correlates from .536 to .746 with the other entrance examinations, these correlations with the information blank scores are comparatively low. Considered as reliabilities they would be extremely low. They demonstrate that students' reports of high school standing and an objective test over high school materials do not result in the same

Table 6

Fourth order partial correlations of the five tests with grades for men, for women, and for men and women. (For variables see Table 5).

Fourth order Partials	Men	Women	Men and Women
$r_{12.3456}$	.099	.027	.072
$r_{13.2456}$	.044	.225	.075
$r_{14.2356}$	.244	.006	.184
$r_{15.2346}$	.082	.196	.165
$r_{16.2345}$	.296	.292	.318

thing. Holding the factor of Iowa High School Content scores constant, the partial correlations of the information blank scores with grades are for men .383, for women .325, and for men and women .422.

Interpretation of Correaltions

The above correlations seem to say that the questionnaire is measuring a very substantial factor, or group of factors, not measured by the entrance examinations, which influence general scholastic success. This is true for the particular data under consideration but might not hold true if the test were given at the opening of school and another prediction made. That the test was given in January makes it entirely possible that many students in recording their high school standing were consciously or unconsciously influenced by their university standing at that time. It is impossible to correct for this factor, and only the trial of the test for another year will answer the question.*

* The data of 1926, at hand as this study goes to the printer, shows no lowering of these correlations.

The Sex Factor

Careful study of the correlations presented in Table five shows some rather unexpected ups and downs when men and women are thrown together. There is obviously a potent sex factor operating. Table seven presents the means and standard deviations of men and women for the five tests and for grade points. It is to be noted that the mean grade points of the women exceed the men by about 40 per cent of the standard deviation of the men's grades. Only English Aptitude, English Training, and the questionnaire part of the test parallel this tendency of the women to receive higher grade points.

Table 7

Means and standard deviations of grades and of the five tests for men, for women, and for men and women; significance of observed difference between means of men and women. (For variables see Table 5).

Variables	*Men*		*Women*		*Men and Women*		Obs. diff. of means
	M	S.D	M	S.D	M	S.D.	P.E. diff.
1	1.49	1.24	1.99	.89	1.67	1.15	11.3
2	51.44	28.60	50.25	27.94	51.02	28.37	.8
3	45.92	26.51	58.31	27.01	50.30	28.68	9.0
4	43.64	28.12	65.63	24.05	51.39	28.83	15.2
5	52.90	28.96	47.77	28.30	51.07	28.85	3.9
6	−2.23	9.78	7.11	9.54	1.01	10.74	18.9

Environmental Factors Measured by Questionnaire

What are the factors in the environmental background of the student which are potent in determining college scholastic success? Study of the scoring method used for the questionnaire given on pages 45 and 46 will indicate some of the investigator's guesses. In this section will be presented the results of a detailed analysis of the data.

Before giving these data, a summary of the items in the Jones questionnaire which did not prove significant for scholastic success is presented. So much investigation has recently been given to these miscellaneous factors that a catalogue of negative instances is as important as the detailed presentation of positive instances. The Jones questionnaire was filled out by all freshmen in the fall of 1923. The author is under special obligation to Dean Jones for the gracious permission to use these data. From among nearly 600 cases, the fifty men who received the highest grades and the fifty who received the lowest grades for the first semester of the year 1923-24 were selected. The information supplied by these two opposed groups was tabulated. The items which did not prove to be significant were the following:

The reported ease or difficulty of high school courses; reasons for coming to the university; vocational choice and certainty of vocational choice; various study habits such as budget of time, systematic note taking, study alone or with others, study in own room or elsewhere, review prior to class; outside jobs while in high school, number, kind, amount of time given to them, degree of pride in work, whether ever fired or not; members of family living, number in family, order of birth; father's occupation; church membership of parents, age of joining church; and favorite childhood game.

Thirteen items in the Jones questionnaire seemed to be possibly significant. These items were combined with an additional thirteen to make up the questionnaire. Detailed analysis of the significance of each of these items for men and women separately was made possible by use of the Hollerith sorting machine. The procedure consisted simply in determining the mean grade points of students supplying certain items of information. The detailed analysis was made of 369 cases of men (a random sample of 125 cases being laid aside) and of 269 cases of women. Table eight presents the obtained data.

Significance of Environmental Factors

It has not seemed worth while to subject the data from which Table eight was derived to an exact analysis for the purpose of determining the statistical significance of its items. With the large numbers of cases involved, an item must be clearly statistically significant to be of any value. Exact analysis would require the calculation of nearly 300 standard deviations and nearly 300 probable errors of means. The purpose of determining the statistically significant items has been approximately accomplished by calculating the probable errors of a few selected means using the standard deviations given in Table seven. The significant environmental factors seem to be as follows:

There is a very slight tendency for the students from the farm, from the smaller towns, and from the smaller high school graduating classes (items one, two and three of Table eight) to do somewhat poorer work than other students. The tendency is hardly statistically significant. Only item number three for women, by just the right combination of figures (125 or fewer versus 126 or more), yields a possibly significant difference 4.3 times as large as the probable error of the difference.

The eight questions concerning high school standing are all exceedingly significant. It is these items that are mainly responsible

Table 8

Mean grade points and number of men and women supplying certain items of information in answer to questions in the questionnaire.

Question	Answer	Women		Men	
1. What part of your life have you lived on a farm?		N	M	N	M
	Not at all	165	2.00	210	1.68
	1-4 years	21	1.95	42	1.53
	5-8 years	20	1.61	22	1.47
	9-12 years	13	2.13	25	1.33
	Over 13 years	48	1.88	70	1.43
	No data	2			
	One or more years	102	1.88	159	1.44
2. How large a town have you lived in for the most part of your life?					
	Under 500	27	2.09	39	1.57
	500-1500	69	1.89	102	1.28
	1500-4000	46	1.91	61	1.63
	4000-6000	22	1.66	17	1.91
	Over 6000	83	2.04	124	1.62
	No data	22		26	
	1500 and under			141	1.36
	1500 and over			202	1.65
3. How many were in your graduating class?					
	1-10	26	1.86	37	1.47
	11-20	46	1.97	63	1.49
	21-40	59	1.89	90	1.39
	41-75	38	1.62	48	1.67
	76-125	46	1.97	55	1.64
	Over 125	54	2.30	75	1.55
	No data			1	
	40 or fewer	131	1.83	190	1.44
	41 or more	138	2.00	178	1.61
	125 or fewer	215	1.87		
	126 or more	54	2.30		
4. Where did you rank in your graduating class?					
	Top	49	2.49	38	2.45
	Upper 10 per cent	91	2.26	113	2.02
	Above middle	69	1.85	109	1.59
	Middle	56	1.13	93	.57
	Below middle	4		16	.95
		N	M	N	M
		N	M	N	M
		N	M	N	M
		N	M	N	M
5. What did you rank in your high school classes in geometry (or algebra or arithmetic)?					
	Top	38	2.52	56	2.14
	Upper 10 per cent	80	2.32	108	1.77
	Above middle	59	1.89	89	1.58
	Middle	61	1.41	71	1.13
	Below middle	31	1.61	43	.84
	No data			2	

Table 8 (Continued)

Question	Answer	Women		Men	
6.	Where did you rank in your high school classes in history?				
	Top	37	2.42	50	2.09
	Upper 10 per cent	74	2.28	119	1.81
	Above middle	67	2.02	94	1.49
	Middle	66	1.59	71	1.06
	Below middle	25	1.12	30	.89
	No data			2	
7.	Where did you rank in your high school classes in grammar and rhetoric?				
	Top	52	2.25	25	2.19
	Upper 10 per cent	90	2.20	89	2.27
	Above middle	77	1.67	101	1.50
	Middle	47	1.65	98	1.11
	Below middle	3		56	.74
8.	Where did you rank in your high school classes in English literature?				
	Top	58	2.27	22	2.15
	Upper 10 per cent	92	2.12	105	2.19
	Above middle	78	1.82	112	1.43
	Middle	39	1.41	86	1.06
	Below middle	1		41	.72
	No data	1		3	
9.	Where did you rank in your high school classes in physics, chemistry or general science?				
	Top	22	2.45	46	2.13
	Upper 10 per cent	65	2.21	98	1.86
	Above middle	62	2.00	93	1.50
	Middle	75	1.83	81	1.24
	Below middle	39	1.37	41	.58
	No data	6		10	
10.	Where did you rank in your high school classes in civics (or modern government or social science)?				
	Top	28	2.52	41	2.12
	Upper 10 per cent	78	2.16	107	1.91
	Above middle	72	2.06	114	1.37
	Middle	68	1.59	76	1.04
	Below middle	20	1.19	19	.58
	No data	3		12	
11.	Where did you ranks in your high school classes in languages?				
	Top	43	2.43	18	2.84
	Upper 10 per cent	67	2.27	58	2.25
	Above middle	59	1.98	73	1.89
	Middle	40	1.44	74	1.36
	Below middle	20	1.25	74	1.08
	No data	40		72	

Table 8 (Continued)

Question	Answer	Women		Men	
12.	While in high school, how active were you in debate, oratory, dramatics, music, and so forth?				
	One of the most active	53	1.84	52	1.90
	Among 10 per cent most active	46	2.01	64	1.55
	Above the middle	34	2.04	61	1.68
	Middle	54	2.05	59	1.70
	Below middle	30	2.01	35	1.49
	Among 10 per cent least active	48	1.87	84	1.22
	No data	4		14	
	Middle and above			236	1.70
	Below middle			119	1.30
13.	During how many of your summer vacations since you began high school have you had a steady job?				
	None	176	2.01	34	1.84
	One	27	2.17	29	1.38
	Two	23	1.96	50	1.64
	Three	14	1.61	61	1.65
	Four	12	1.50	106	1.33
	Five	9	1.77	83	1.46
	No data	8		6	
	None, one, or two	226	2.06	113	1.64
	Three, four or five	35	1.61	250	1.45
14.	How much do you estimate that your first semester here will cost you (include tuition and cost of clothing)?				
	$50-150	22	1.91	31	1.75
	$150-250	37	2.15	75	1.55
	$250-350	62	2.09	107	1.76
	$350-450	52	2.00	52	1.26
	$450-550	54	2.00	52	1.26
	Over $550	34	1.68	31	1.37
	No data	8		5	
	Less than $350			213	1.68
	More than $350			151	1.31
15.	How much schooling did your father have?				
	Less than four years	8	1.91	16	.93
	5-8 years	57	1.88	132	1.53
	Part of high school	67	1.91	74	1.54
	High school graduate	36	1.84	37	1.89
	Some college	53	2.09	54	1.59
	Received college degree	48	2.10	43	1.25
	No data			13	
16.	How much schooling did your mother have?				
	Less than four years	0	-------	17	1.83
	5-8 years	53	2.07	109	1.65
	Part of high school	79	1.98	83	1.50
	High school graduate	60	1.89	75	1.36
	Some college	53	1.96	53	1.24
	Received college degree	22	1.91	32	1.85
	No data	2			

Table 8 (Continued)

Question	Answer	Women		Men	
17.	Whether or not you belong to a fraternity or sorority, do you think membership in one increases one's scholastic standing?				
	No	56	1.89	92	1.67
	Undecided	101	2.10	129	1.44
	Yes	111	1.89	142	1.49
	No data	1		6	
18.	If you do not belong to a fraternity or sorority would you join if asked by a good organization?				
	No	22	2.15	57	1.53
	Undecided	65	1.99	124	1.57
	Yes	114	1.88	122	1.48
	No data (those who evidently belong)	68	2.01	66	1.50
19.	Courses taken in high school				
	Took Latin	197	2.01	241	1.71
	Did not	72	1.82	128	.95
	Took French	70	2.21	53	1.83
	Did not	199	1.87	316	1.47
	Took German			8	2.66
	Did not			361	1.50
	Took chemistry	43	2.00	85	1.53
	Did not	226	1.95	284	1.52
	Took social problems	106	1.95	185	1.56
	Did not	163	1.96	184	1.49
	Took agriculture	92	1.79	165	1.29
	Did not	177	2.04	204	1.75
	Took normal training	51	1.81		
	Did not	218	2.00		
	Took bookkeeping	58	1.88	126	1.44
	Did not	211	1.98	243	1.56
	Took manual training	12	1.05	248	1.46
	Did not	257	2.01	121	1.81
	Took typewriting	76	1.94	120	1.65
	Did not	193	1.97	249	1.46
	Took commercial geography	58	1.75	149	1.44
	Did not	211	2.01	220	1.67
	Took commercial law	35	1.83	143	1.48
	Did not	234	1.99	226	1.60

Table 8 (Continued)

Question	Answer	Women		Men	
20.	Name the sports in which you played on your high school team either as regular or as substitute.				
	None named	116	2.05	84	2.01
	One named	103	1.94	80	1.50
	Two named	26	1.64	91	1.39
	Three named	24	1.98	86	1.20
	Four or five named			28	1.41
	None named			84	2.01
	One to five named			285	1.36
23.	Name the musical instruments in your home.				
	None named	11	1.41	35	.79
	One named	65	2.00	67	1.46
	Two named	78	2.03	108	1.62
	Three named	46	1.98	62	1.50
	Four named	37	1.88	43	1.55
	Five or more named	32	1.96	54	1.58
	None named	11	1.41	35	.79
	One or more	258	1.98	334	1.55
24.	Name the reproductions of well known works of art and the paintings of good artists in your home.				
	None named	144	1.98	269	1.40
	One named	43	1.79	47	1.80
	Two or three named	56	1.98	44	1.80
	Four or more named	26	2.03	9	2.24
	One or more named			100	1.84
25.	Name the newspapers.				
	None named	16	1.57	41	1.10
	One named	48	1.88	69	1.49
	Two named	100	1.95	157	1.52
	Three named	74	2.01	73	1.41
	Four or more named	32	2.04	27	2.31
	None or one named			110	1.34
	Two or more named			259	1.56
26.	Name the magazines.				
	None named	24	1.71	56	1.03
	One to three named	107	1.93	150	1.40
	Four or more named	138	2.03	163	1.76

for the high correlation of this part of the test with scholastic success. There is evidently a very marked tendency for students to over-rate their high school standing. The data of Table eight seems to say that these students stood well above the middle of their high school classes, while Stoddard has shown (unpublished study) by objective tests that freshmen at the University of Iowa are only

slightly superior to senior high school students of representative school systems.

There is a statistically significant tendency (4.4 P.Es.) for the men who participate in high school debate and so forth to do better scholastically than those who do not participate. It is always difficult to interpret failure to respond to a question. In this instance the mean grade points of the fourteen men who failed to indicate any response to this question is .32. This tendency, however, does not hold for women.

There is a very small, but consistent, tendency for men and women who have had steady jobs during summer vacations to do slightly poorer work than those who have not. The indicated division of the data for women yields the only statistically significant difference (4.5 P.Es.).

There is a small but statistically significant tendency (4.1 P.Es.) for men who report an estimate of more than $350 expense for the first semester to do poorer work than those who estimate their expense at less than $350. The same tendency appears among the women but it is not statistically significant.

Education of father and mother is not associated with the scholastic success of women. Among the men the irregularity of the figures makes it difficult to say what the tendency is.

There is no significant tendency in the responses to questions number seventeen and eighteen concerning fraternities.

The courses taken or not taken in high school reveal many items significant for college scholastic success. Both men and women who took Latin in high school do better scholastically, but the tendency is significant only in the case of men (8.4 P.Es.). Those who took French do better scholastically. Here the tendency is statistically significant for both men (4.0 P.Es.) and women (4.2 P.Es.). The stalwart eight souls who took German attained much higher grades than those who did not. The difference of 1.16 grade points is 8.8 times as large as its probable error. High school chemistry, social problems, normal training, bookkeeping, typewriting, commercial geography, and commercial law are not significantly associated with college success. Both men and women who took agriculture or manual training do somewhat poorer work in college. For men both of these items are statistically significant, the ratios being 5.1 P.Es. and 4.0 P.Es. respectively. For women only the item of manual training is clearly significant, the difference of nearly a whole grade point being seven times its probable error.

Participation in high school athletics is clearly associated with college failure among the men, the observed difference being 6.5 times its probable error.

The last three questions deal with the home environment. Lack of musical instruments in the home is clearly associated with failure among men, the ratio of the observed difference to its probable error being 6.9. The same tendency appears, though to a lesser degree, among the women. The men who fail to name any work of art in their homes do distinctly poorer work than those who name one or more (4.6 P.Es.). There is a very slight tendency for men and women who report only one or no newspapers in their homes to do poorer work, but the tendency is not statistically significant. The same tendency appears for magazines. In this case the difference is significant for men (5.5 P.Es.).

CHAPTER VI

SUMMARY AND CONCLUSIONS

This study reports an attempt to measure the character and environmental factors other than intelligence* involved in the scholastic success of freshmen at the University of Iowa.

After considerable preliminary experimental work a test was devised and given in January of 1926 to the freshman class entering the University in the fall of 1925. This test consisted of three parts: a test of attitudes and interests, a point-scale self-rating device, and a questionnaire. The whole test contained a total of 360 test items and required from thirty to thirty-five minutes testing time. Four hundred ninety-four men and 269 women for whom first semester grades and the four entrance examinations were available were selected for intensive study.

Statistical Findings

The statistical analysis of these data may be very briefly summarized. The analysis of the test of attitudes and interests centered around the separation of significant test elements into those primarily diagnostic of scholastic success and those primarily diagnostic of intelligence. Analysis of 374 cases of men revealed ninety-four significant items. A scoring system was devised and applied to 120 cases specially laid aside for this purpose prior to the analysis. The scores from these ninety-four items correlated .422 with grade-points and .541 with intelligence. The analysis further revealed which of these items were more diagnostic of achievement and which were diagnostic of intelligence. The sixty items most diagnostic of achievement correlated .497 with grades and .493 with intelligence. The reliability of these sixty items was .76. The thirty-four items most diagnostic of intelligence correlated .180 with grades and .404 with intelligence. These data demonstrate that the elaborate analysis succeeded in separating from among the significant items those measuring factors other than intelligence. These data indicate a substantial predictive power for this portion of the test even

* "Intelligence" has been used as a convenient term to refer to whatever is measured by the four mental-educational tests making up the battery of entrance examinations at the University of Iowa.

though as high a prediction would hardly be expected with another year's data. The low reliability clearly points to the need for discovery of further significant items.

An actual prediction of scholastic success was made from the self-rating part of the test for a sample of 225 cases of men. These scores correlated .369 with grades and .309 with intelligence, their reliability being only .484. A time limit on the revised test given in the fall of 1926 and the possibility of putting the significant items into question form led to the abandonment of this procedure. Further analysis was accordingly fragmentary. The data, however, are most significant. The higher correlation with grades with no attempt to lift out the items primarily diagnostic of success is to be noted. The low reliability promises improved predictive power with the discovery of similar items.

An actual prediction of scholastic success was also made from the questionnaire part of the test, in this case for the total of 763 men and women. These scores correlated .557, .536, and .567 with grade points and yielded an average correlation with the four entrance examinations of .481. The fourth order partial correlation of this portion of the test with grades for men and women was .318. This is to be compared with the similar partials for the other tests of .072, .075, .184, and .165. However, whether this prediction will maintain itself another year is uncertain for the reason that the test was given so near the end of the semester.

In summary of the statistical studies, while none of the original or revised predictions is very high, all are substantial and compare not unfavorably with predictions from the best mental-educational tests available. Although some overlapping and duplication of factors measured by this test and the entrance examinations must be expected, the correlations demonstrate that substantial independent factors are being measured. The reliabilities are generally low, giving promise that with the addition of significant items the procedure can be much improved.

The Factors Involved

The interpretation of the factors measured and associated with success or failure is more difficult and involved. Considering first the environmental background, the school and home stand out as important. Students' reports of high school standing is the most significant of all the factors measured. The comparatively low correlation of these scores with an objective examination over high

school materials demonstrates that these reports are getting at some independent factor. In high school, as in college, many students do definitely better or poorer work than would be expected from objective measures of their stock of informations, intellectual skills, and aptitudes. To the degree that students' reports of high school success measure this tendency and to the degree that it continues to operate in college, to that extent their reports measure independent factors involved in college achievement. These reports do not tell us what these factors are, but they are probably the best single measure of them. The exact accuracy of these reports is, of course, most difficult to determine. Inspection of the records in the registrar's office revealed the impossibility of comparing them with actual grades for the reason that every school system used its own method of marking and very few freshmen come from any one system. The high correlation of these reports with college success is sufficient evidence of their substantial accuracy.

Other specific factors in the high school environment that are associated with college success are: participation in debate, dramatics, etc.; non-participation in high school athletics; election of Latin, French and German; non-election of agriculture and manual training; and the size of the graduating class. It is not suggested that these factors lie in the direct chain of causal events determining in part college achievement. They are probably only symptoms of antecedent and more fundamental conditions.

The home environment plays its small but discernible part in the complex of conditions determining scholastic achievement. Associated with scholastic success are the presence in the home of works of art, musical instruments, magazines and newspapers; parental interest in school work; freedom from strict home discipline; and freedom from formal and churchly religious training. There are hints that superior economic status is also involved. But the education of father and mother seems not important.

Seven fairly clear character and personality traits appear to stand out. The successful students consistently report a stronger interest in intellectual and cultural things. In contrast, the failure groups are more interested in mechanical things such as electricity, wireless, repairing an automobile, and building a radio. A strongly conventional and thoroughly unimaginative tendency is revealed by the excessive liking of the failure groups for such items as "do as you are told", "slow but sure", "detail work", "have a salary", and "be a follower". If these are the ideals of the failing student

it is small wonder that they perish in a university atmosphere. This conventionalism is revealed especially in the field of religion. The failure group like "sermon", "church", "be religious", "do religious work", and at the same time dislike "spiritual", "spiritual immortality", and "religious toleration". Almost identically the same tendency appears in the field of political interest. The failure group gives strong liking responses to "patriotism", "The Star Spangled Banner", "our country right or wrong", and reacts negatively to "fair play for the slacker" and "humanity is above any nation". Two further tendencies suggest that several diverse types distinct from the conventionalists may help to make up the failure group. The failure group tends to report a greater need for social contacts; they cannot bear to work alone, they must have companionship. This tendency bridges the conflict between straight-laced conventionalism and a final pleasure-seeking tendency. The failure group reacts more positively to "have a big allowance", "easy going life", "dancing", and "Pierce Arrow".

These interpretations are, of course, not final nor are they the only possible ones. The situation is so immensely complex and the limitations of the data are such that it is hardly worth while attempting an exactly worded and precisely qualified statement of what is or is not involved. The author could easily append a good many pages of interesting and suggestive alternative interpretations, all of which deserve consideration. The discriminating reader will supply these other interpretations and consider the ones presented as suggestive and tentative.

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Appendix I

The Assayer

UNIVERSITY OF IOWA ASSAYER

Series 2A.

Name..... Sex..... Date.....

Instructions.

In this test you are to indicate whether you like, dislike or feel indifferent about certain words and phrases. Notice the Sample List. After each word or phrase are placed a D d ? l L.

(D) means dislike very much
(d) means dislike
(?) means indifferent
(l) means like
(L) means like very much

Thus in the Sample List, if you neither like nor dislike the word "pencil", you would place a circle around the question mark, thus (?); or if you like the word "contented", you would place a circle around the small l, thus (l), and so on.

Notice in the Sample List that there are only a few very strong liking or disliking marks. Notice that every word is marked by a circle around either the D or d or ? or l or L.

Mark the Practice List according to these instructions. Do this now.

Sample List.

pencil	D	d	(?)	l	L
contented	D	d	?	(l)	L
uncomfortable	D	(d)	?	l	L
killings	(D)	d	?	l	L
happiness	D	d	?	l	(L)
vase	D	d	(?)	l	L
stones	D	d	(?)	l	L
children	D	d	?	(l)	L
health	D	d	?	(l)	L
disappoint	D	(d)	?	l	L
food	D	d	?	(l)	L
long life	D	d	?	(l)	L
Glinka	D	d	(?)	l	L
parents	D	d	?	l	(L)
Lincoln	D	d	?	l	(L)
false friend	(D)	d	?	l	L
be hurt	D	(d)	?	l	L

Practice List.

Melody	D	d	?	l	L
dirty	D	d	?	l	L
American	D	d	?	l	L
be wealthy	D	d	?	l	L
worry	D	d	?	l	L
slums	D	d	?	l	L
study	D	d	?	l	L
pious	D	d	?	l	L
mystery	D	d	?	l	L
fast ride	D	d	?	l	L
slang	D	d	?	l	L
rouge	D	d	?	l	L
Rolls Royce	D	d	?	l	L
sabbath	D	d	?	l	L
angels	D	d	?	l	L
fear things	D	d	?	l	L
bully	D	d	?	l	L

You are to mark the words and phrases on the following pages in the same manner that you marked the practice list. Work fast. Put down your snap judgments. Mark every word. You will be allowed only 18 minutes for this part of the test.

Do Not Turn Page Until Told To Do So.

Copyright, 1925. F. K. Shuttleworth

List 1.

1.	be absent minded	D	d	?	l	L
2.	have a big allowance	D	d	?	l	L
3.	a few close friends	D	d	?	l	L
4.	adventure stories	D	d	?	l	L
5.	amount to something	D	d	?	l	L
6.	argue about things	D	d	?	l	L
7.	learn more about art	D	d	?	l	L
8.	be your own boss	D	d	?	l	L
9.	build a reputation	D	d	?	l	L
10.	classic music is a fad	D	d	?	l	L
11.	have creative ideas	D	d	?	l	L
12.	have a guilty conscience	D	d	?	l	L
13.	debate and oratory	D	d	?	l	L
14.	do as you are told	D	d	?	l	L
15.	freer discussion	D	d	?	l	L
16.	friendly gambling	D	d	?	l	L
17.	go after what you want	D	d	?	l	L
18.	have a good memory	D	d	?	l	L
19.	always have a good time	D	d	?	l	L
20.	ideals and aspirations	D	d	?	l	L
21.	invent something	D	d	?	l	L
22.	immortality	D	d	?	l	L
23	have to be frugal	D	d	?	l	L
24.	hear nasty stories	D	d	?	l	L
25.	keep your promises	D	d	?	l	L
26.	know that you can succeed	D	d	?	l	L
27.	know things as they are	D	d	?	l	L
28.	have many friends	D	d	?	l	L
29.	learn more about music	D	d	?	l	L
30.	limit free speech	D	d	?	l	L
31.	live in a dirty home	D	d	?	l	L
32.	national defense	D	d	?	l	L
33.	read book reviews	D	d	?	l	L
34.	repression of free speech	D	d	?	l	L
35.	have responsibility	D	d	?	l	L
36.	save every penny	D	d	?	l	L
37.	saxophone music	D	d	?	l	L
38.	short story magazines	D	d	?	i	L
39.	slap stick comedy	D	d	?	l	L
40.	speculative studies	D	d	?	l	L
41.	do something new	D	d	?	l	L
42.	conscience stricken	D	d	?	l	L
43.	work with a radio	D	d	?	l	L
44.	take part in discussions	D	d	?	l	L
45.	to be open minded	D	d	?	l	L
46.	theoretical studies	D	d	?	l	L
47.	ugly scar on the face	D	d	?	l	L
48.	work by your self	D	d	?	l	L
49.	world disarmament	D	d	?	l	L

List 2.

50.	achieve	D	d	?	l	L
51.	anguish	D	d	?	l	L
52.	ankle	D	d	?	l	L
53.	ardent	D	d	?	l	L
54.	aspire	D	d	?	l	L
55.	avarice	D	d	?	l	L
56.	beauty	D	d	?	l	L
57.	betrothed	D	d	?	l	L
58.	belle	D	d	?	l	L

59.	blaspheme	D	d	?	1	L
60.	cards	D	d	?	1	L
61.	Chaucer	D	d	?	1	L
62.	children	D	d	?	1	L
63.	church	D	d	?	1	L
64.	dancing	D	d	?	1	L
65.	despair	D	d	?	1	L
66.	drama	D	d	?	1	L
67.	egotism	D	d	?	1	L
68.	ennoble	D	d	?	1	L
69.	farming	D	d	?	1	L
70.	fame	D	d	?	1	L
71.	frank	D	d	?	1	L
72.	free love	D	d	?	1	L
73.	friends	D	d	?	1	L
74.	hired man	D	d	?	1	L
75.	idealism	D	d	?	1	L
76.	impotent	D	d	?	1	L
77.	injustice	D	d	?	1	L
78.	larceny	D	d	?	1	L
79.	leisure	D	d	?	1	L
80.	love	D	d	?	1	L
81.	marriage	D	d	?	1	L
82.	murder	D	d	?	1	L
83.	navy	D	d	?	1	L
84.	poetry	D	d	?	1	L
85.	poker	D	d	?	1	L
86.	poverty	D	d	?	1	L
87.	obedience	D	d	?	1	L
88.	romance	D	d	?	1	L
89.	sermon	D	d	?	1	L
90.	shrewd	D	d	?	1	L
91.	Shylock	D	d	?	1	L
92.	slacker	D	d	?	1	L
93.	smoke	D	d	?	1	L
94.	spiritual	D	d	?	1	L
95.	be sorry	D	d	?	1	L
96.	squalor	D	d	?	1	L
97.	war	D	d	?	1	L
98.	wireless	D	d	?	1	L

List 3.

99.	agitator	D	d	?	1	L
100.	beautiful	D	d	?	1	L
101.	Beethoven	D	d	?	1	L
102.	be on time	D	d	?	1	L
103.	"big head"	D	d	?	1	L
104.	burglary	D	d	?	1	L
105.	candidate	D	d	?	1	L
106.	canoeing	D	d	?	1	L
107.	cigarette	D	d	?	1	L
108.	concerts	D	d	?	1	L
109.	creative	D	d	?	1	L
110.	day laborer	D	d	?	1	L
111.	detail work	D	d	?	1	L
112.	drive a car	D	d	?	1	L
113.	early to bed	D	d	?	1	L
114.	effective	D	d	?	1	L
115.	electricity	D	d	?	1	L
116.	evangelism	D	d	?	1	L
117.	fear things	D	d	?	1	L

118.	hypocrisy	D	d	?	l	L
119.	immortality	D	d	?	l	L
120.	irreverent	D	d	?	l	L
121.	fickle lover	D	d	?	l	L
122.	hunch back	D	d	?	l	L
123.	landscape	D	d	?	l	L
124.	late hours	D	d	?	l	L
125.	lax morality	D	d	?	l	L
126.	literature	D	d	?	l	L
127.	be lucky	D	d	?	l	L
128.	Money mad	D	d	?	l	L
129.	oppression	D	d	?	l	L
130.	patriotism	D	d	?	l	L
131.	picnicking	D	d	?	l	L
132.	Pierce Arrow	D	d	?	l	L
133.	politician	D	d	?	l	L
134.	progress	D	d	?	l	L
135.	puritanical	D	d	?	l	L
136.	be religious	D	d	?	l	L
137.	Rembrandt	D	d	?	l	L
138.	sacrilegious	D	d	?	l	L
139.	sculpture	D	d	?	l	L
140.	selfishness	D	d	?	l	L
141.	sex novels	D	d	?	l	L
142.	sleep late	D	d	?	l	L
143.	splendid	D	d	?	l	L
144.	steady pay	D	d	?	l	L
145.	superior	D	d	?	l	L
146.	swearing	D	d	?	l	L
147.	work hard	D	d	?	l	L

List 4.

148.	abject poverty	D	d	?	l	L
149.	be aggressive	D	d	?	l	L
150.	America first	D	d	?	l	L
151.	be ambitious	D	d	?	l	L
152.	have the blues	D	d	?	l	L
153.	build a radio	D	d	?	l	L
154.	cathedrals	D	d	?	l	L
155.	cheap pictures	D	d	?	l	L
156.	clerical work	D	d	?	l	L
157.	creative mind	D	d	?	l	L
158.	depend on luck	D	d	?	l	L
159.	be discouraged	D	d	?	l	L
160.	discussions	D	d	?	l	L
161.	do religious work	D	d	?	l	L
162.	double standard	D	d	?	l	L
163.	easy going life	D	d	?	l	L
164.	be efficient	D	d	?	l	L
165.	ethical religion	D	d	?	l	L
166.	fear death	D	d	?	l	L
167.	be a follower	D	d	?	l	L
168.	get recognition	D	d	?	l	L
169.	good patriots	D	d	?	l	L
170.	hear symphonies	D	d	?	l	L
171.	be inferior	D	d	?	l	L
172.	have influence	D	d	?	l	L
173.	intelligence	D	d	?	l	L
174.	jazzy music	D	d	?	l	L
175.	be a leader	D	d	?	l	L
176.	Literary Digest	D	d	?	l	L

177.	manage things	D	d	?	l	L
178.	mental anguish	D	d	?	l	L
179.	Midland Stories	D	d	?	l	L
180.	more faith in God	D	d	?	l	L
181.	Phi Beta Kappa	D	d	?	l	L
182.	Psalms of David	D	d	?	l	L
183.	social progress	D	d	?	l	L
184.	ragged clothes	D	d	?	l	L
185.	remember details	D	d	?	l	L
186.	have a salary	D	d	?	l	L
187.	salvation by faith	D	d	?	l	L
188.	seek the facts	D	d	?	l	L
189.	slow but sure	D	d	?	l	L
190.	social justice	D	d	?	l	L
191.	be somebody	D	d	?	l	L
192.	get somewhere	D	d	?	l	L
193.	tenement life	D	d	?	l	L
194.	think quickly	D	d	?	l	L
195.	more use of prayer	D	d	?	l	L
196.	violin music	D	d	?	l	L

List 5.

197.	ask yourself if life is worth living	D	d	?	l	L
198.	have a big allowance	D	d	?	l	L
199.	a high powered automobile	D	d	?	l	L
200.	be attracted to the opposite sex	D	d	?	l	L
201.	big nations crushing small	D	d	?	l	L
202.	be interested in mechanical things	D	d	?	l	L
203.	Christianize the world	D	d	?	l	L
204.	have confidence in your ability	D	d	?	l	L
205.	be head of a large organization	D	d	?	l	L
206.	work with delicate things	D	d	?	l	L
207.	do as you please once in a while	D	d	?	l	L
208.	do one thing, preach another	D	d	?	l	L
209.	enemies of the government	D	d	?	l	L
210.	fair play for the slacker	D	d	?	l	L
211.	the fathers of the Constitution	D	d	?	l	L
212.	figure things out beforehand	D	d	?	l	L
213.	be free from rigid rules	D	d	?	l	L
214.	freedom for small nations	D	d	?	l	L
215.	have friends only with your own sex	D	d	?	l	L
216.	get further than your father	D	d	?	l	L
217.	have to toe the mark in your classes	D	d	?	l	L
218.	humanity is above any nation	D	d	?	l	L
219.	be careful not to hurt the feelings of others	D	d	?	l	L
220.	inspect an automobile plant	D	d	?	l	L
221.	learn more about other religions	D	d	?	l	L
222.	work with machinery	D	d	?	l	L
223.	more strict divorce laws	D	d	?	l	L
224.	missionary work in the foreign field	D	d	?	l	L
225.	not get credit for what you do	D	d	?	l	L
226.	obey the rules even when they are irksome	D	d	?	l	L
227.	the old fashioned religion	D	d	?	l	L
228.	our country, right or wrong	D	d	?	l	L
229.	other religious faiths	D	d	?	l	L
230.	ours is a great nation	D	d	?	l	L
231.	Popular Science Magazine	D	d	?	l	L
232.	religious toleration	D	d	?	l	L
233.	repair an automobile	D	d	?	l	L
234.	have the respect of a few who count	D	d	?	l	L
235.	reverence for the church	D	d	?	l	L

236.	see both sides of political problems	D	d	?	l	L
237.	sing "Onward Christian Soldiers"	D	d	?	l	L
238.	spiritual immortality	D	d	?	l	L
239.	start from the bottom	D	d	?	l	L
240.	The Star Spangled Banner	D	d	?	l	L
241.	unpatriotic attitude	D	d	?	l	L
242.	The U. S. has never been despotic	D	d	?	l	L
243.	the world needs a new idealism	D	d	?	l	L
244.	true religion is good will toward men	D	d	?	l	L
245.	worry over possible failures	D	d	?	l	L

(Go on to Part II)

Appendix II

The Self-rating Device

Part II

Below are pairs of opposite qualities or traits. The dotted line between each pair is a scale on which you are asked to rate yourself. If you think you have about equal amounts of both qualities check the colon; if more of one than the other, check to the right or left of the colon as far as best represents your case.

For example, if you should have quite dark hair your statement of that fact might be like this:

Very dark hair . / . . : . . . . Very light hair

Check always on the dot or on the colon rather than between them. Begin slowly, then work fast. You will have nine minutes for this part of the test.

1. Very dark hair . . . . : . . . . Very light hair
2. Dark complexion . . . . : . . . . Very light complexion
3. Always make friends easily . . . . : . . . . Make friends with difficulty
4. Rather delicate health . . . . : . . . . Always healthy
5. Desire to succeed financially . . . . : . . . . More interested in other things
6. Careful in speaking not to hurt the feelings of others . . . . : . . . . Outspoken and thoughtless
7. Poor memory . . . . : . . . . Very retentive memory
8. Worry about exams . . . . : . . . . Do not worry about exams
9. Work things out in a minimum of time . . . . : . . . . Like to take lots of time
10. Attend young people's societies . . . . : . . . . Do not attend young people's societies
11. Can be trusted to keep promises . . . . : . . . . Lax in keeping promises
12. Avoid opposite sex . . . . : . . . . Strongly attracted to the opposite sex
13. Seek to know God's will . . . . : . . . . No such effort
14. Often forget important things . . . . : . . . . Usually remember important things
15. Worry over possible misfortunes . . . . : . . . . Do not worry over possible misfortunes
16. Conservative in religion . . . . : . . . . Radical in religion
17. Think slowly and deliberately . . . . : . . . . Think quickly
18. Believe in race equality . . . . : . . . . Content with race inequality
19. Difficulty in concentrating . . . . : . . . . Easy to concentrate
20. Dislike to be alone in a big house . . . . : . . . . Don't mind it a bit
21. Attention shifts . . . . : . . . . Attention easily applied to work at hand
22. Like company of the other sex . . . . : . . . . Prefer to go with persons of your own sex
23. Never lend . . . . : . . . . Generous in lending anyone who asks
24. Tendency to be secretive . . . . : . . . . Open and frank
25. Recover from anger quickly . . . . : . . . . Hold grudge indefinitely
26. Treat negro as socially inferior . . . . : . . . . Treat negro as social equal
27. Like physical work . . . . : . . . . Do not enjoy physical work

28.	High respect for the Bible as authority	Indifferent to the Bible as authority
29.	Do not enjoy mental work	Like mental work
30.	God seems far away	God seems very near
31.	Carefree and gay most of time	Usually serious
32.	Have no visual imagery of God	Always picture God
33.	Practical	Intellectual
34.	Your family entered seriously into family worship	No family worship
35.	Aggressive	Easy going
36.	Stubborn or obstinate	Too easily persuaded
37.	Cheerful	Usually sad, sober or melancholy
38.	Prompt in keeping appointments	Often tardy or lax in keeping appointments
39.	Brought up to attend young people's societies	Brought up to attend young people's societies not at all
40.	Always do things on time	Rarely get things done as planned
41.	Like long continued activity	Like bursts of activity with rest between
42.	Brought up to attend church not at all	Brought up to attend church regularly
43.	Persistent in an undertaking	Shifting from one thing to another
44.	Perfect ease in staying in a room with the door shut	Cannot bear it
45.	Habit of praying during childhood	Never prayed in childhood
46.	Like to drive a car	Prefer to let someone else drive
47.	Thoughts jump here there and everywhere	Thoughts easily controlled
48.	An easy mark for a good salesman	Can't be sold anything you do not want
49.	Persistent ideas continually bother	No such experience
50.	Must have companionship	Content to be by yourself
51.	Irregular in habits	Regular in habits
52.	Look forward to marriage	Do not
53.	Religious faith has been much weakened recently	Religious faith has grown stronger
54.	Always changing your mind	Rarely reverse decisions
55.	Tendency to do what some one else tells you to do	Tendency to do just the opposite
56.	Like dancing primarily because of music and graceful movement	Like dancing, but not chiefly for this reason
57.	Shift from one thing to another	Stick to it
58.	Confident of ability	Lack confidence
59.	Get confused and distracted during examinations	Work at highest efficiency during examinations
60.	Warm and friendly	Cold and passionless
61.	Attentive to dress and personal appearance	Unconcerned about fashion and appearance
62.	Know that you can make good	Uncertain of it

63. Go after the things you want . . . . : . . . . Tend to wait for things to come your way
64. Like to work on definite task . . . . : . . . . Like to work on task requiring ingenuity
65. Say frankly what you think regardless of hurting the feelings of others . . . . : . . . . Try to say what will sound pleasant
66. Keep troubles to yourself . . . . : . . . . Tell troubles to anyone
67. Like to use your own initiative . . . . : . . . . Like to rely on someone else
68. Usually persuade the other person to your opinion . . . . : . . . . Usually get persuaded to the other's opinion
69. Never aware of talking to yourself . . . . : . . . . Often talk to yourself
70. Have always had some responsibility at home . . . . : . . . . Have never had responsibility at home
71. Like to take care of children . . . . : . . . . Dislike it
72. Parents always much interested in your school work . . . . : . . . . Parents rarely much interested
73. Parents very strict in early home training . . . . : . . . . Parents permitted you to do as you pleased
74. Like to read Popular Science Magazine . . . . : . . . . Dislike it
75. Very ambitious . . . . : . . . . Rather ambitionless
76. Like jazz music . . . . : . . . . Dislike it
77. Much interested in art, drama, literature etc. . . . . : . . . . Not interested
78. Like to work with people . . . . : . . . . Dislike to work with people

(Go on to Part III)

Appendix III

The Questionnaire

Part III.

Place a cross (x) on the line under the correct answers to the following questions. You have four minutes for this part of the test.

1. What part of your life have you lived on a farm?

Not at all	1-4 years	5-8 years	9-12 years	over 13 years

2. How large a town have you lived in for the greater part of your life?

Under 500	500-1500	1500-4000	4000-6000	over 6000

3. How many were in your graduating class?

1-10	11-20	21-40	41-75	76-125	over 125

4. Where did you rank in your graduating class?

Top	Upper 10%	Above Middle	Middle	Below Middle	Lower 10%	Bottom

5. Where did you rank in your high school classes in geometry (or algebra or arithmetic?

Top	Upper 10%	Above Middle	Middle	Below Middle	Lower 10%	Bottom

6. Where did you rank in your high school classes in history?

Top	Upper 10%	Above Middle	Middle	Below Middle	Lower 10%	Bottom

7. Where did you rank in your high school classes in grammar and rhetoric?

Top	Upper 10%	Above Middle	Middle	Below Middle	Lower 10%	Bottom

8. Where did you rank in your high school classes in English literature?

Top	Upper 10%	Above Middle	Middle	Below Middle	Lower 10%	Bottom

9. Where did you rank in your high school classes in physics, chemistry, or general science?

Top	Upper 10%	Above Middle	Middle	Below Middle	Lower 10%	Bottom

10. Where did you rank in your high school classes in civics (or modern government or social problems)?

Top	Upper 10%	Above Middle	Middle	Below Middle	Lower 10%	Bottom

11. Where did you rank in your high school classes in languages (French, German, Latin or Spanish)?

Top	Upper 10%	Above Middle	Middle	Below Middle	Lower 10%	Bottom

12. While in high school, how active were you in debate, oratory, dramatics, music, etc.?

One of most	Among 10% most	Above Middle	Middle	Below Middle	Among 10% least	Took no part
.....	.....	.....	.....	.....	.....	.....

13. During how many of your summer vacations since you began high school have you had a steady job?

None	One	Two	Three	Four	Five
.....	.....	.....	.....	.....	.....

14. How much do you estimate that your first semester here will cost you (include tuition and cost of clothing)?

$50-150	$150-250	$250-350	$350-450	$450-550	Over $550
.....	.....	.....	.....	.....	.....

15. How much schooling did your father have?

Less than 4 years	5-8 years	Part of high school	High school graduate	Some college	Received college degree
.....	.....	.....	.....	.....	.....

16. How much schooling did your mother have?

Less than 4 years	5-8 years	Part of high school	High school graduate	Some college	Received college degree
.....	.....	.....	.....	.....	.....

17. Whether or not you belong to a fraternity or sorority, do you think membership in one increases one's scholastic standing?

No	Undecided	Yes
.....	.....	.....

18. If you do not belong to a fraternity or sorority would you join if asked by a good organization?

No	Undecided	Yes
.....	.....	.....

19. Which of the following courses did you take in high school?

.....Latin	.....Normal Training
.....French	.....Bookkeeping
.....German	.....Manual Training
.....Chemistry	.....Typewriting
.....Social problems	.....Commercial Geography
.....Agriculture	.....Commercial Law

20. Name the sports in which you played on your high school team either as regular or as substitute.....

21. What is your father's occupation? (If dead, state what his occupation was).....

22. What are you planning on making your future vocation?.....

23. Name the musical instruments you have in your home.....

.....

24. Name the reproductions of well known works of art and the paintings of good artists in your home.....

.....

25. Name the newspapers.....

26. Name the magazines or periodicals.....

.....

Appendix IV

The Revised Test

STUDENT INFORMATION BLANK

UNIVERSITY OF IOWA

Constructed by

FRANK K. SHUTTLEWORTH

Name ..... Date.....
(last name) (first name) (middle name)

NOTE: The information asked for in this blank is being collected from all freshmen. The information will be held strictly confidential and will be used for research and advisory purposes only. *Answer all questions* even though some of them may seem unimportant to you.

PART I.

INSTRUCTIONS: Place a cross (x) on line *after* the *most* correct answer to the following questions. Be *accurate*. Give *complete* information. Work reasonably fast.

1. What is your sex? Male.....; female.....
2. Your age? 16 or younger.....; 17.....; 18.....; 19.....; 20.....; 21.....; 22.....; 23.....; 24 or older.....
3. Your weight? (Check the nearest answer) 90 pounds.....; 100.....; 110.....; 120.....; 130.....; 140.....; 150.....; 160.....; 170.....; 180.....; 190.....
4. How many years of your life have you lived on a farm? Never lived on a farm.....; from 1 to 4 years.....; 5 to 8 years.....; 9 to 12.....; 13 to 16.....; all of my life.....
5. How large a town or city have you lived in for the greater part of your life? Never lived in town or city.....; lived in town of less than 1000 for most part; town of 1100 to 2500.....; 2600 to 5000.....; 5100 to 15,000.....; 15,100 to 25,100.....; 25,100 to 50,000.....; over 50,000.....
6. How many were in your graduating class? 1 to 10.....; 11 to 20.....; 21 to 40.....; 41 to 75.....; 76 to 125.....; over 125.....
7. How many letters did you win in major sports in high school? None.....; one.....; two.....; three.....; four.....; five .....; six or more.....
8. During how many of your summer vacations since you began high school have you had a steady job? No steady job during any summer.....; steady job one summer.....; two summers.....; three.....; four.....; five.....
9. What percentage of your earnings during your high school period have you saved? Had no earnings to save.....; saved none of earnings.....; saved 10%.....; 25%.....; 50%.....; 75%.....; all.....
10. How much money of your earning did you have to start college with? None.....; $5 to 25.....; $30 to 50.....; $55 to 100..... $105 to 150.....; $155 to 200.....; $205 to 300.....; $305 to 500.....; over $500.....
11. How many musical instruments do you have in your home? None.....; one.....; two.....; three.....; four.....; five.....; six.....; seven or more.....

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12. What musical instruments do you have in your home? Violin.....; piano.....; phonograph.....; radio.....; saxophone.....; cello..... ; banjo.....; drums.....; cornet.....; clarinet.....; mandolin.....
13. Name the reproductions of well known works of art and paintings of good artists that you have in your home.....
.....
14. Name the newspapers that you have in your home.....
.....
15. Name the magazines and periodicals that you have in your home.....
.....
16. How many magazines or periodicals have you read rather regularly the last two years? None.....; one.....; two.....; three.....; four or more..... Name them.....
.....
17. How many novels, books of fiction, of adventure, etc. have you read the last two years? (Do not count school readings) None.....; one or two.....; three or four.....; five or six.....; seven to ten.....; over ten.....
18. How many serious books have you read the last two years outside of school reading? None.....; one or two.....; three or four.....; five or six.....; seven to ten.....; over ten.....

Go right on to the next page.

19. How much schooling did your father have? Less than four years.....; from five to eight years.....; part of high school.....; graduated from high school.....; part of college.....; graduated from college.....
20. How much schooling did your mother have? Less than four years.....; from five to eight years.....; part of high school.....; graduated from high school.....; part of college.....; graduated from college.....
21. What is the chief source of your father's (or guardian's) income? Daily wage.....; weekly wage.....; monthly wage..... ....; yearly wage.....; from business.....; from stocks, bonds, interest, rents.....
22. Do your parents own real estate other than their own home? Yes.....; no.....
23. How many automobiles do your parents own? None.....; one.....; two or more.....
24. Have your parents been interested in your school work? Yes, very much.....; yes, considerably.....; yes, somewhat.....; rather indifferent.....; not interested.....
25. Have your parents been strict in their home discipline? Yes, very strict.....; yes, rather strict.....; little home discipline.....; no home discipline whatever.....
26. Have you had religious worship in your home? Yes, regularly.....; yes, quite often.....; occasionally.....; rarely.....; never.....
27. Does your father attend religious services? Yes, regularly.....; yes, quite often.....; occasionally.....; rarely.....; never.....
28. Does your mother attend religious services? Yes, regularly.....; yes, quite often.....; occasionally.....; rarely.....; never.....
29. Have you attended Sunday school or church the last four years? Yes, regularly.....; yes, quite often.....; yes, occasionally.....; rarely.....; never.....
30. Have you been in love or thought yourself in love? Yes.....; no.....
31. How much have you gone with the opposite sex the last two years? Little or none.....; once or twice a month.....; averaged a date a week.....; averaged several dates a week.....
32. Have you dated steadily with one person? Yes.....; no, have dated with several.....; no, never date.....
33. Have you gone to country dances or dances in neighboring towns the last two years? No, never..... occasionally.....; once a month.....; several times a month.....

34. Have you had the use of an automobile whenever you wished it the last two years? Yes, have my own car.....; yes, have entirely free use of parent's car.....; no, but usually can get parent's permission.....; no, never had use of car.....
35. How many hours of sleep have you averaged the past year? Five hours or less.....; six hours.....; seven.....; eight.....; nine.....; ten or more.....
36. How much do you estimate that your first semester here will cost you? From $50 to 100.....; $110 to 150.....; $160 to 250.....; $260 to 350.....; $360 to 450.....; $460 to 550.....; over $550.....
37. What part of your way are you planning on working this semester? None.....; lodging or its equivalent.....; board or its equivalent.....; board and lodging.....
38. How many hours a day do you estimate that you will put in this semester in helping yourself through school? None.....; one.....; two.....; three.....; four.....; five.....; six or more.....
39. Whether or not you belong to a fraternity or sorority, do you think membership in one increases one's chances for scholastic success? Yes.....; don't know.....; no.....
40. Do you plan on typing your written work or on getting it typed this semester? Yes.....; no.....
41. Do you get confused and distracted during examinations? Yes, very much.....; yes, somewhat.....; rarely confused.....; work at best efficiency.....
42. Do you like mental work? Yes, very much.....; yes, somewhat.....; somewhat dislike it.....; thoroughly dislike it.....
43. Do you have a good memory for school work? Yes, very retentive.....; yes, good.....; rather indifferent memory.....; poor memory.....
44. Do you have difficulty in concentrating on your studies? Yes, very much.....; yes, somewhat.....; little difficulty in concentrating.....; perfect ease in concentrating.....

Go right on to the next page.

PART II.

High School Record

Where did you stand in your various high school courses?

Make a cross (x) under the heading which indicates where you stood in each subject. Be *accurate.* Give *complete* information. Work reasonably fast.

SUBJECT	At the top	Upper 10%	Above middle	At the middle	Below middle	Lower 10%	At the bottom
Composition, rhetoric, grammar							
Literature (American, English, Classic)							
History							
Mathematics (algebra, geometry)							
Latin							
French							
Spanish							
Physics							
Chemistry							
Biology, botany, zoology							
General science							
Physiology							
Civics, American government							
Economics							
Sociology							
Commercial Geography							
Commercial Law							
Bookkeeping							
Typewriting							
Domestic Science							
Manual Training							
Pedagogy							
Psychology							
Agriculture							
Public Speaking							
Music							
General standing senior year							
General standing all four years							

How many were in your graduating class? 1 to 10.....; 11 to 20.....; 21 to 40.....; 41 to 75.....; 76 to 125.....; over 125.....

Name of the high school from which you graduated.....

Go right on to next page.

PART III.

In this part of the information blank you are to indicate whether you like, dislike, or feel indifferent about certain things. Notice the lists below. You are to

draw a cross through the	D	after the things you dislike very much
draw a cross through the	d	after the things you dislike somewhat
draw a cross through the	?	after the things you feel indifferent about
draw a cross through the	l	after the things you like somewhat
draw a cross through the	L	after the things you like very much

You probably dislike *murder* very much. Notice how this word is marked in the first list below. You probably like very much to *be happy,* you probably neither like nor dislike *pencils,* undoubtedly you rather dislike to *be hurt* and rather like to *be well.* Notice how these things are marked in the list below.

Mark all the words and phrases below in the same manner. Begin slowly, then work fast. Be *accurate*. Give *complete* information.

murder	D	d	?	l	L	immortality	D	d	?	l	L
be happy	D	d	?	l	L	irrreverent	D	d	?	l	L
pencils	D	d	?	l	L	late hours	D	d	?	l	L
be hurt	D	d	?	l	L	be lucky	D	d	?	l	L
be well	D	d	?	l	L	oppression	D	d	?	l	L
anguish	D	d	?	l	L	patriotism	D	d	?	l	L
ankle	D	d	?	l	L	politician	D	d	?	l	L
ardent	D	d	?	l	L	be religious	D	d	?	l	L
aspire	D	d	?	l	L	Rembrandt	D	d	?	l	L
avarice	D	d	?	l	L	sleep late	D	d	?	l	L
blaspheme	D	d	?	l	L	steady pay	D	d	?	l	L
cards	D	d	?	l	L	swearing	D	d	?	l	L
church	D	d	?	l	L	work hard	D	d	?	l	L
dancing	D	d	?	i	L	abject poverty	D	d	?	l	L
egotism	D	d	?	l	L	America first	D	d	?	l	L
hired man	D	d	?	l	L	be ambitious	D	d	?	l	L
leisure	D	d	?	l	L	build a radio	D	d	?	l	L
marriage	D	d	?	l	L	clerical work	D	d	?	l	L
poker	D	d	?	l	L	be discouraged	D	d	?	l	L
sermon	D	d	?	l	L	do religious work	D	d	?	l	L
Shylock	D	d	?	l	L	double standard	D	d	?	l	L
smoke	D	d	?	l	L	easy going life	D	d	?	l	L
spiritual	D	d	?	l	L	fickle lover	D	d	?	l	L
squalor	D	d	?	l	L	be a follower	D	d	?	l	L
wireless	D	d	?	l	L	hear symphonies	D	d	?	l	L
agitator	D	d	?	l	L	be inferior	D	d	?	l	L
Beethoven	D	d	?	l	L	mental anguish	D	d	?	l	L
burglary	D	d	?	l	L	Pierce Arrow	D	d	?	l	L
candidate	D	d	?	l	L	puritanical	D	d	?	l	L
canoeing	D	d	?	l	L	sacrilegious	D	d	?	l	L
cigarette	D	d	?	l	L	have a salary	D	d	?	l	L
concerts	D	d	?	l	L	seek the facts	D	d	?	l	L
creative	D	d	?	l	L	slow but sure	D	d	?	l	L
day laborer	D	d	?	l	L	be somebody	D	d	?	l	L
early to bed	D	d	?	l	L	get somewhere	D	d	?	l	L
electricity	D	d	?	l	L	detail work	D	d	?	l	L
hypocrisy	D	d	?	l	L	obedience	D	d	?	l	L
be absent minded	D	d	?	l	L	violin music	D	d	?	l	L
argue about things	D	d	?	l	L	slap stick comedy	D	d	?	l	L
build a reputation	D	d	?	l	L	spiritual immortality	D	d	?	l	L
have creative ideas	D	d	?	l	L	religious toleration	D	d	?	i	L
do as you are told	D	d	?	l	L	to be open minded	D	d	?	l	L
freer discussion	D	d	?	l	L	unpatriotic attitude	D	d	?	l	L
have a big allowance	D	d	?	l	L	work with machinery	D	d	?	l	L
invent something	D	d	?	l	L	more use of prayer	D	d	?	l	L
bodily immortality	D	d	?	l	L	sing religious hymns	D	d	?	l	L
have to be frugal	D	d	?	l	L	have to toe the mark	D	d	?	l	L
hear nasty stories	D	d	?	l	L	repair an automobile	D	d	?	l	L
limit free speech	D	d	?	l	L	start from the bottom	D	d	?	l	L
save every penny	D	d	?	l	L	hard work will win	D	d	?	l	L

ask if life is worth living	D	d	?	l	L
big nations crushing small	D	d	?	l	L
classic music is a fad	D	d	?	l	L
have a guilty conscience	D	d	?	l	L
enemies of the government	D	d	?	l	L
Christianize the world	D	d	?	l	L
work with delicate things	D	d	?	l	L

fair play for the slacker	D	d	?	1	L
get further than your father	D	d	?	1	L
humanity is above any nation	D	d	?	1	L
inspect an automobile plant	D	d	?	1	L
more strict divorce laws	D	d	?	1	L
missionary work abroad	D	d	?	1	L
the old fashioned religion	D	d	?	1	L
our country, right or wrong	D	d	?	1	L
Popular Science Magazine	D	d	?	1	L
The Star Spangled Banner	D	d	?	1	L
true religion is good will	D	d	?	1	L
repression of free speech	D	d	?	1	L
be free from rigid rules	D	d	?	1	L
be head of a large organization	D	d	?	1	L
sing ''Onward Christian Soldiers''	D	d	?	1	L
the father of his country	D	d	?	1	L
the world needs new ideals	D	d	?	1	L
attend religious services	D	d	?	1	L